A revision of the Old World Polymorphanisini (Trichoptera: Hydropsychidae)

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Contents

Synopsis

The Old World species of the tribe Polymorphanisini, with its constituent genera *Oestropsyche* Brauer, *Aethaloptera* Brauer and *Polymorphanisus* Walker, are revised. One new generic and eight new specific synonyms are established; four new species are described. Seven lectotypes and one neotype are designated. Keys are given to the twenty-five species currently recognized.

Introduction

The Polymorphanisini are one of the most discrete tribes within the Hydropsychidae; although they are superficially very similar to the other species of the subfamily Macronematinae, they have an obvious diagnostic character in the absence of mouthparts. This paper deals only with the Old World species; the endemic Neotropical genus *Synoestropsis* is distinguished in the key to genera, but most of its constituent species are dealt with in recent publications by O. S. Flint, Jr (e.g. Flint, 1978).

The subfamily Macronematinae was revised by Ulmer (1907) and this remains the basis for any work on this group, Ulmer's monograph being complete for all the literature up to that date. Although many of the species of the tribe Macronematini, especially of *Macronema* itself, can be readily identified by their wing pattern, the Polymorphanisini are relatively uniform in general

Bull. Br. Mus. nat. Hist. (Ent.) **41** (2): 59–106 Issued 25 September 1980

appearance and have always been considered a difficult group to identify correctly. For example, in his paper on the Trichoptera of Ghana, Gibbs (1973) remarks 'Because of a lack of modern figures of male genitalia, African species of *Polymorphanisus* are usually in some doubt.' I hope the present paper will remove this difficulty, but in fact a study of the genitalia has not yielded many useful characters. The keys are based on 'external' characters, namely features of the wing venation, coloration, thoracic markings and so on, and these, together with the known distribution of the species, are sufficient to separate all the species in the tribe. The genitalia of both sexes (where known) of each species are described and figured, however, because they are often useful in confirming the identity of superficially similar species. Of the 25 species included in this paper, the males of ten are unknown, which is another reason for the limited use of genitalic characters.

All the drawings in this paper were made using a camera lucida attachment on a stereomicroscope. Male genitalia preparations were examined and drawn in glycerine to avoid any distortion due to flattening. In the females the eighth sternite, which was the only feature found to exhibit consistent specific characters, was drawn from permanent preparations in Euparal, deliberately flattened to facilitate comparability of outline of this curved sclerite.

Classification of the Macronematinae

The first division of the Hydropsychidae was made by Brauer (1868) who erected the 'subfamily' Oestropsidae, for *Oestropsis* and *Polymorphanisus,* on the basis of the absence of the palps: *Macronema* was retained in the Hydropsychidae sensu stricto. Later, Brauer (1875) described the genus *Phanostoma* which he also placed in the Oestropsidae along with *Aethaloptera,* although *Phanostoma* (now synonymized with *Amphipsyche*) has normal mouthparts.

McLachlan (1878: 350, 353) divided the Hydropsychidae into five sections: his section I corresponds with Brauer's Oestropsidae, containing *Polymorphanisus, Oestropsis, Phanostoma, Aethaloptera* and *Amphipsyche.* Ulmer (1907) united McLachlan's sections I and II (which contained *Macronema* and *Blepharopus*) to form the Macronematinae, stating that the name Oestropsidae could not be used, not even in the form Oestropsinae, because *Oestropsis* had been synonymized with *Polymorphanisus.* This change of name has been generally accepted by authors and is therefore retained under Art. 40 (a) of the *International Code of Zoological Nomenclature.* Denning (1943) tried to revive the name Oestropsinae in preference to Ulmer's Macronematinae but other authors have not accepted this change. Two other minor changes to this group name have been proposed: Banks (1913) uses the Macronematidae as a family name (apparently in the same sense as Ulmer's subfamily), and Navás (1926) reduced the group to a tribe, but neither change has been accepted by subsequent authors.

The first attempt at splitting the Macronematinae sensu Ulmer was by Lestage (1936) who divided the subfamily into two tribes, the Macronematini and the Polymorphanisini, the latter distinguished by the loss of the palps. This division has been accepted by most authors and is the one adopted in the present paper. Surprisingly, Ulmer (1951) continued to use his subfamily Macronematinae with no further subdivision. Banks's (1939) introduction of the name Oestropsychinae is difficult to interpret as the group apparently includes *Polymorphanisus, Oestropsyche* and *Amphipsyche.* If it is intended to replace the Polymorphanisini then *Amphipsyche* is erroneously included, but in any case it is an unnecessary replacement name. Marlier (1962) accepts Lestage's division of the subfamily but renames the Polymorphanisini as the Oestropsychini, which again is an unnecessary replacement name. The only other change recently proposed is the standardization of the tribe name to Polymorphanisini by Flint (1974; 1978) and Scott (1975).

Abbreviations

AM	Albany Museum, Grahamstown
ANIC	Australian National Insect Collection, C.S.I.R.O., Canberra
BMNH	British Museum (Natural History), London
IM	Indian Museum, Calcutta

IRSNB Institut Royal des Sciences Naturelles de Belgique, Brussels
IZPAN Instytut Zoologiczny, Polska Akademia Nauk, Warsaw
MCZ Museum of Comparative Zoology, Harvard
MNHN Muséum National d'Histoire Naturelle, Paris
MNHU Museum für Naturkunde der Humboldt-Universität, Berlin
MRAC Musée Royal de l'Afrique Centrale, Tervuren
NM Naturhistorisches Museum, Vienna
NMV National Museum of Victoria, Melbourne
RNH Rijksmuseum van Natuurlijke Historie, Leiden
USNM U.S. National Museum, Smithsonian Institution, Washington
ZI Zoological Institute, Leningrad
ZM Zoologisches Museum, Hamburg

Acknowledgements

I am very grateful to the following for the loan or donation of specimens: Ms J. Cardale, C.S.I.R.O., Canberra; Dr J. Decelle, MRAC, Tervuren; Dr O. S. Flint, Jr, USNM, Washington; Dr D. C. Geijskes, RNH, Leiden; Dr H. J. Hanneman, MNHU, Berlin; Dr A. Kaltenbach, NM, Vienna; Dr J. Legrand, MNHN, Paris; Dr A. Liana, IZPAN, Warsaw; Dr G. Marlier, IRSNB, Brussels; Dr K. M. F. Scott, AM, Grahamstown; Prof. Dr H. Strümpel, ZM, Hamburg; Ms M. K. Thayer, MCZ, Harvard. Thanks are also due to Dr A. Neboiss, NMV, Melbourne, for bringing the Australian material to my attention. I am grateful to my colleague Dr P. E. S. Whalley for commenting on the manuscript.

Taxonomic section

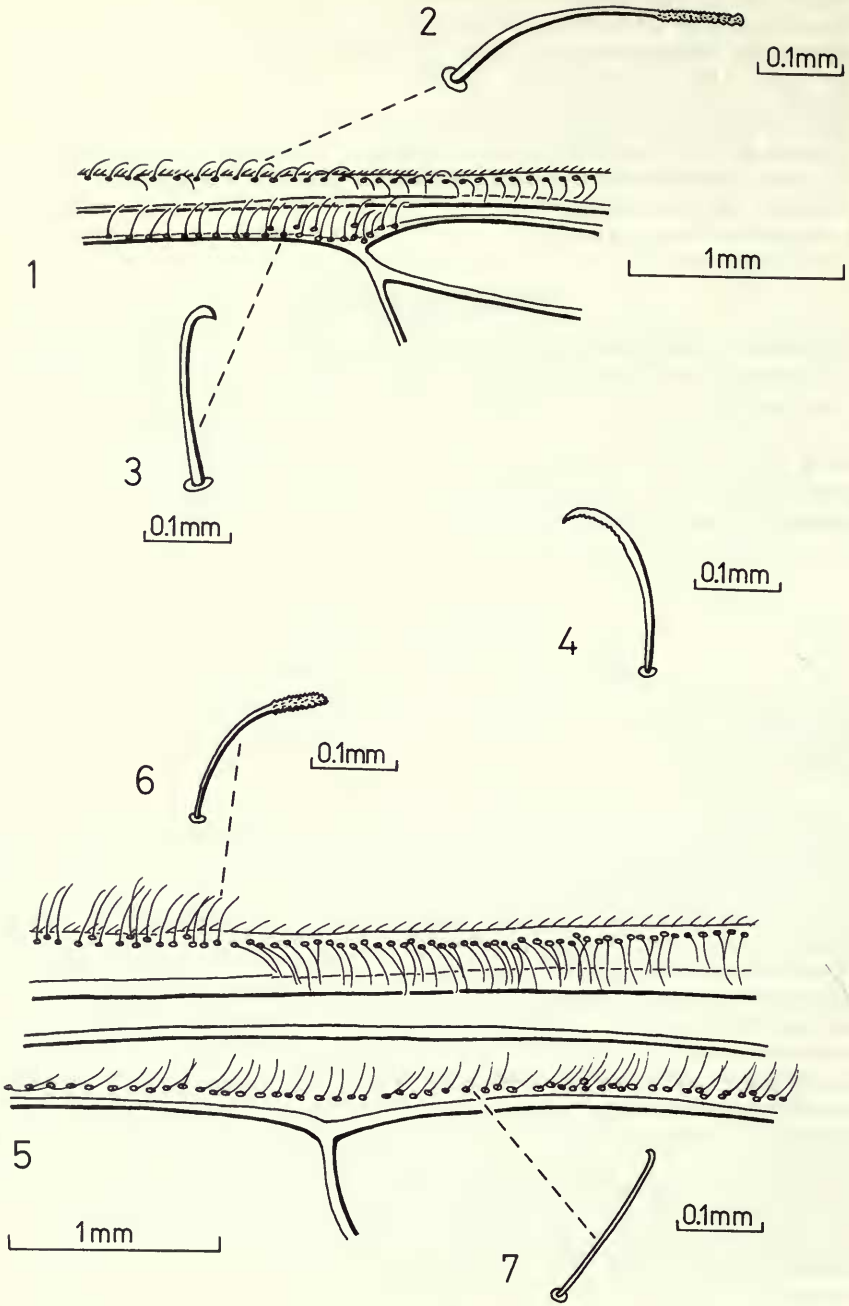
Tribe **POLYMORPHANISINI** Lestage

Polymorphanisi Lestage, 1936: 176. Type-genus: *Polymorphanisus* Walker.
Oestropsychini Marlier, 1962: 118. Type-genus: *Oestropsyche* Brauer.
Polymorphanisini; Flint, 1974: 115.

Medium to large species, wing length 8–28 mm, yellow or brownish in coloration, probably always greenish in life. Antennae usually longer than wings, occasionally up to four times fore wing length. Scape large and bulbous, pedicel narrow, ring-like. Flagellar segments numerous, up to 95 in some species, always long and narrow. Head with one or two pairs of setigerous warts on vertex; hind pair, if present, often reduced, especially in ♀. Eyes usually small, but greatly enlarged and almost meeting ventrally in ♂ of the *Polymorphanisus ocularis*-group. Mouthparts always absent, traces of palps occasionally visible. Thorax with large, shield-shaped mesoscutellum, often with black markings in the *P. nigricornis*-group. Legs often with dark tips to tibiae and femora (but not constant within species). Spurs 0.2.2, 0.3.2, 1.2.2, 1.3.2 or 1.3.3. Mesothoracic legs often greatly broadened in ♀, only slightly so (if at all) in ♂. Wing-coupling mechanism consists of one or two rows of curved macrotrichia near costa of hind wing, engaging on anal fold of fore wing. Discal and median cell usually present in fore wing; in *Oestropsyche* discal cell absent, in *Aethaloptera* 'false' discal cell produced by secondary fusion of R_{4+5}. Both cells absent in hind wing; 'false' discal cell occasionally present (though not consistent) in *Aethaloptera*. In fore wing *Sc* and R_1 separate, but fused for most of length in *Oestropsyche*. Cu_2 ends on wing margin in *Polymorphanisus,* but on *2A* in other genera. In hind wing *Sc* and R_1 either fused (*Oestropsyche, Aethaloptera*) or R_1 ends on *Sc* (*P. ocularis*-group) or R_1 free (*P. nigricornis*-group); R_2 and R_3 usually separate (fused in *Polymorphanisus*).

♂ genitalia with well-sclerotized, ring-like ninth segment and one- or two-segmented, elongate gonopods. Aedeagus greatly enlarged distally, with complex internal structure. ♀ genitalia with elongate tubular ninth segment, membranous ventrally with various tubercles. Eighth sternite partially divided into two plates.

Remarks. The loss of the mouthparts is the most obvious distinguishing feature of this group; the separation of this tribe from the Macronematini is also supported by larval characters (Scott, 1975). Betten (1934) described the distinctive wing-coupling mechanism in *Macronema,* which has a single row of curved, hook-like macrotrichia along the costal margin of the hind wing. This seems to be the general pattern throughout the Macronematini, and this type is also found in *Aethaloptera*. A more advanced form is seen in *Oestropsyche* (Fig. 1) where a second row of



Figs 1–7 1–3, *Oestropsyche vitrina* ♀, wing coupling mechanism, (1) costal area of hind wing; (2) costal hair; (3) radial hair. 4, *Aethaloptera dispar* ♂, costal hair from hind wing. 5–7, *Polymorphanisus semperi* ♂, (5) costal area of hind wing; (6) costal hair; (7) radial hair.

hooked macrotrichia is present on the stem of *Rs*. In *Polymorphanisus* (Fig. 5) and *Synoestropsis* this row of macrotrichia has migrated forwards to lie anteriorly to *Rs*. Both species groups of *Polymorphanisus* are similar in this respect. The detailed structure of these macrotrichia also varies within the group. In *Aethaloptera* (Fig. 4) the hooks are toothed on the inner side, just as described in *Macronema* by Betten (1934). In *Oestropsyche* and *Polymorphanisus* the radial hooks are not toothed (Figs 3, 7) whereas the costal hairs are only slightly curved but have an enlarged, roughened tip (Figs 2, 6). In all cases the length of the macrotrichia varies according to their position on the wing. In the fore wing *2A* is greatly thickened and prominent, and the wings tend to fold along this vein, providing an attachment point for the hooks on the hind wing.

Geographical distribution

Most species of Polymorphanisini are restricted to tropical or subtropical areas. Apart from the genus *Synoestropsis,* which is endemic to South America, the tribe is represented in the Afrotropical region (sensu Crosskey & White, 1977) and Madagascar, and throughout the Indian, South East Asian, Malaysian and Indonesian regions, including the Philippines. The far eastern species *Aethaloptera sexpunctata* just reaches northern Australia. Although several species are found in southern and central China, the main exception to the broad pattern of distribution is *A. evanescens,* which occurs in the Amur Region of the U.S.S.R. and southern Siberia. A few species have very wide distributions, such as *Oestropsyche vitrina* and *Aethaloptera sexpunctata* (Fig. 46).

Biology

There is very little published information on the habitats of the Polymorphanisini, but one can infer from the existing data that larvae of many of the species inhabit fairly large rivers, not necessarily fast flowing.

Very few larvae in the group have been described. Ulmer (1912) and Barnard (1934) both described what were believed to be larvae of *Aethaloptera* spp., but these were later referred to *Macronema* (Ulmer, 1957). The larva of *A. dispar* was subsequently described by Gibbs (1973). Marlier's (1943) 'larve C de Macronematinae' was shown to be a species of *Polymorphanisus* by Ulmer (1957) and later Marlier (1958; 1961) redescribed what he believed to be the same species. Since the adults collected at the same time are *P. elisabethae,* the larvae are probably the same species, and not *bipunctatus* as Marlier believed. Scott (1975) has summarized the larval characters of these two African genera and has shown that the distinction between the Polymorphanisini and the Macronematini is supported by the larval features. Outside Africa only two other species have definitely associated larvae. These are *Aethaloptera evanescens* in the U.S.S.R., described (as *rossica*) by Lepneva (1970), and *Oestropsyche vitrina,* described by Ulmer (1957) from material from Sumatra and the Philippines.

Larvae of the neotropical genus *Synoestropsis* have been described, but not associated with any known species (Flint, 1978).

Check-list of Old World Polymorphanisini

OESTROPSYCHE Brauer
- ***vitrina*** (Hagen)
  - *palingenia* Brauer
  - *hageni* Banks **syn. n.**

AETHALOPTERA Brauer
- *Chloropsyche* McLachlan
- *Primerenca* Navás
- *Paraethaloptera* Martynov **syn. n.**
- ***dispar*** Brauer
  - *maesi* Navás
  - *maerina* Navás
- ***evanescens*** (McLachlan)
  - *rossica* Martynov **syn. n.**
- ***gracilis*** (Martynov) **comb. n.**
- ***maxima*** Ulmer
- ***sexpunctata*** (Kolenati)
  - *dyakana* Banks
  - *punctata* Banks **syn. n.**

POLYMORPHANISUS Walker
Oestropsis Brauer

***nigricornis*-group**
astictus Navás
hainanensis Martynov **syn. n.**
flavipes Banks **syn. n.**
bipunctatus Brauer
elisabethae Navás
bipunctatus pupillatus Navás **syn. n.**
fuscus Ulmer
***hargreavesi* sp. n.**
***marlieri* sp. n.**
***muluensis* sp. n.**
nigricornis Walker
quadripunctatus Ulmer
scutellatus Banks
semperi (Brauer)
taoninus Navás
tumidus Banks
***umbripes* sp. n.**
unipunctus Banks

***ocularis*-group**
angustipennis Ulmer
guttatus Navás
ocularis Ulmer
indicus Banks **syn. n.**
similis Ulmer
bisignatus Navás **syn. n.**

Key to world genera of Polymorphanisini

1 *Rs* and *M* in fore wing connected by cross-vein (Fig. 57). (Neotropical species) . . . ***SYNOESTROPSIS***
– *Rs* and *M* not connected by cross-vein. (Old World species) 2

2 (1) 'False' discal cell present in fore wing (enclosing corneous spot) formed by secondary fusion of R_{4+5} (Fig. 19) . . . . . ***AETHALOPTERA*** (p. 66)
– No 'false' discal cell (Figs 8, 47) 3

3 (2) Discal cell absent in fore wing; *Sc* and R_1 fused for most of length (Fig. 8) . . . ***OESTROPSYCHE*** (p. 64)
– Discal cell present in fore wing; *Sc* and R_1 separate (Fig. 47) ***POLYMORPHANISUS*** (p. 78)

OESTROPSYCHE Brauer

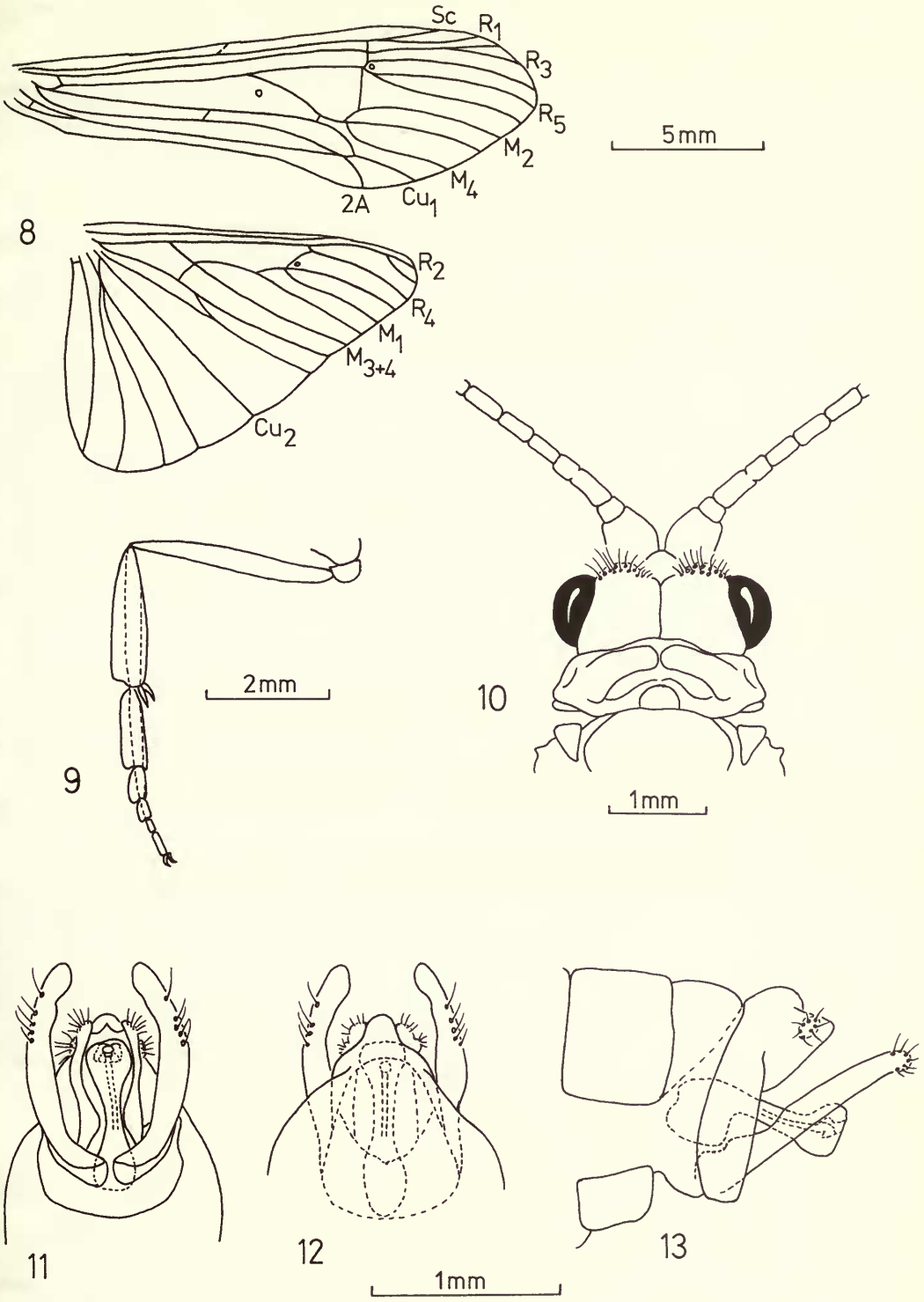
Oestropsyche Brauer, 1868: 265. Type-species: *Oestropsyche palingenia* Brauer [=*Oestropsyche vitrina* (Hagen)], by monotypy.
Oestropsyche Brauer; Ulmer, 1907: 29 [redescription].

Head with slightly raised areas anteriorly on vertex, no tubercles posteriorly (Fig. 10). Frons slightly inflated. Antennae at least twice as long as fore wing in ♂, much shorter than fore wing in ♀. Eyes small, not meeting ventrally. ♂ mesothoracic legs with tibia and tarsal segments slightly dilated (Fig. 9), markedly dilated in ♀ (Fig. 15). Spurs 1.2.2 (1.3.2 in ♂ from Philippines), not 2.3.3 as stated by most authors. Venation as in Figs 8, 14; *Sc* and R_1 fused for most of their length, discal cell absent. Median cell long and broad in ♂, smaller in ♀.

Remarks. Fischer (1963) places this monotypic genus in the Macronematini rather than the Polymorphanisini but the reason for this is not stated. The morphology of both the adults (with the loss of the mouthparts) and of the larvae (described by Ulmer, 1951) clearly show its affinities with the other genera in the Polymorphanisini.

Oestropsyche vitrina (Hagen)
(Figs 8–18)

Macronema vitrinum Hagen, 1859: 209. Holotype ♂, Sri Lanka: Rambodde (*Nietner*) (MCZ, Harvard) [not examined].
Polymorphanisus vitrinus (Hagen) Hagen, 1864: 875.
Oestropsyche palingenia Brauer, 1868: 266. LECTOTYPE ♂, Philippines: Antipolu (*Semper*) (IRSNB, Brussels), here designated [examined]. [Synonymized by Ulmer, 1907: 29; considered valid species by Banks, 1939: 56; synonymized by Ulmer, 1951: 188.]
Oestropsyche vitrina (Hagen) Ulmer, 1907: 29.



Figs 8–13 *Oestropsyche vitrina* ♂. 8, wing venation; 9, mid-leg; 10, head, dorsal view; 11, genitalia, ventral view; 12, genitalia, dorsal view; 13, genitalia, lateral view.

Oestropsyche hageni Banks, 1939: 56. Holotype ♂, INDIA: Mysore, Shimoga, River Tunga, 1865′ [560 m], at light, 21.vii.[? year] (*Nathan*) (type no. 23469, MCZ, Harvard) [examined]. **Syn. n.**
Macronema vitrinum Hagen; Ross, 1952: 35. [Holotype depository.]

♂. Wing length 11–17 mm. Antenna 40–46 mm with about 75 segments. Head pale brown, whitish dorsally, prothorax and tegulae whitish, rest of thorax brown. Eyes black. Abdomen blackish brown dorsally, yellowish brown ventrally. Legs yellowish. Antennae yellowish brown with darker annulations. Wings yellowish.

♀. Wing length 11–16 mm. Antennae 5–10 mm with about 35 segments; segments shorter and narrower than those of ♂. Coloration similar to ♂.

GENITALIA ♂ (Figs 11–13). Ninth tergite with projecting median lobe, gonopods short and stout, apparently unsegmented but with slight constriction distally. Well-developed lateral tubercles on tenth segment.

GENITALIA ♀ (Figs 16–18). Ninth tergite slightly bifid, eighth sternite not completely divided, each half pointed anteriorly.

REMARKS. Hagen's (1859) description of this species is based quite explicitly on a single male; Ross (1952) states that this holotype is in the MCZ, Harvard (although both Banks (1939) and Ulmer (1951) mention two males in Hagen's collection). However, Ulmer (1907; 1951) examined a 'type' in the Selys-Longchamps collection (now in the IRSNB, Brussels) and there is a further 'type' in the BMNH! I have examined these two specimens: both are labelled 'Ceylon, Nietner' and were almost certainly collected at the same time as the MCZ specimen, although presumably not seen by Hagen when he described the species. In the absence of further evidence we must accept the MCZ specimen as being the holotype; the specimens in Brussels and London therefore have no type-status, but are nevertheless important 'topotypic' material.

Banks (1939) distinguished *hageni* from *vitrina* on size and minor venational differences, but these are not constant within any one region as several authors, e.g. Ulmer (1951), have noted. Banks also described a difference in the shape of the tip of the aedeagus of his species *hageni*, but since he observed this from a posterior view, the shape depends entirely on the angle of view, as Ulmer (1951) remarked.

The larva of *vitrina* was described by Ulmer (1957: 371); its habitat in Sri Lanka was noted by Schmid (1958: 107) as 'les rivières assez agitées, en altitude moyenne, où elle est souvent commune'.

DISTRIBUTION. India (Martynov, 1935), Sri Lanka, Philippines, Sumatra, Java, Borneo, Sulawesi (Ulmer, 1951), New Guinea (Papua New Guinea), China (Navás, 1923*a*; Ulmer, 1933).

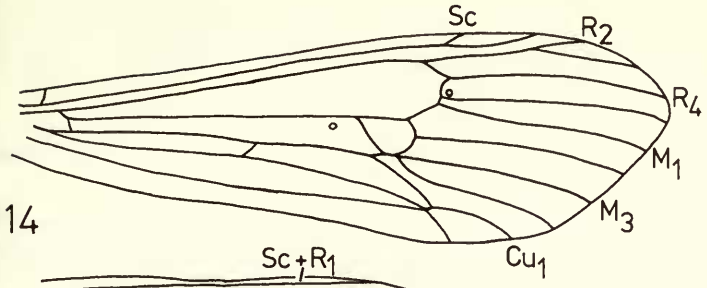
MATERIAL EXAMINED

Sri Lanka: 3 ♂ [Rambodde] (*Nietner*) (2 in BMNH, 1 in IRSNB, Brussels); 2 ♂, 3 ♀, N[awala]piti[y]a (BMNH); 1 ♂ (*Green*) (BMNH); 1 ♀, Pundaluoya, x.1897 (BMNH); 1 ♂, 1 ♀, Lindula, 3.iii.1954 (*Schmid*) (USNM, Washington); 1 ♂, Kitulgala, 2.iii.1954 (*Schmid*) (USNM, Washington); 1 ♀, Uggalkaltota, 500′ [150 m], 10–14.x.1970 (*Flint*) (USNM, Washington). **Sumatra:** 1 ♂, Sandaran Agong, Korinchi, 2450′ [740 m], v–vi.1914 (*Robinson & Kloss*) (BMNH). **Philippines:** 1 ♂, Antipolu (*Semper*) (IRSNB, Brussels) (paralectotype of *Oestropsyche palingenia* Brauer); 1 ♂, 1 ♀, Luzon, Laur, Nueva Ecija, 11–12.ii.1958 (*Thompson*) (USNM, Washington); 1 ♀, Negros, Victorias, at light, 17.vii.1928 (USNM, Washington); 1 ♂, 2 ♀, Luzon, Mt Makiling (*Baker*) (USNM, Washington). **New Guinea:** 1 ♂, 48 ♀, Papua New Guinea, Kokoda, 1200′ [360 m], vii–ix.1933 (*Cheesman*) (BMNH).

AETHALOPTERA Brauer

Aethaloptera Brauer, 1875: 71. Type-species: *Aethaloptera dispar* Brauer, by monotypy.
Chloropsyche McLachlan, 1880: 69. Type-species: *Chloropsyche evanescens* McLachlan, by monotypy. [Synonymized by Kimmins, 1962: 96.]
Primerenca Navás, 1915: 181. Type-species: *Primerenca maesi* Navás, by original designation and monotypy. [Synonymized by Lestage, 1919: 293.]
Paraethaloptera Martynov, 1935: 193. Type-species: *Paraethaloptera gracilis* Martynov, by original designation and monotypy. **Syn. n.**

Head with two pairs of setigerous warts on vertex in ♂ (Fig. 20), posterior pair smaller and weakly developed in ♀ (Fig. 25). Antennae up to four times wing length in ♂, only slightly longer than wing in ♀;



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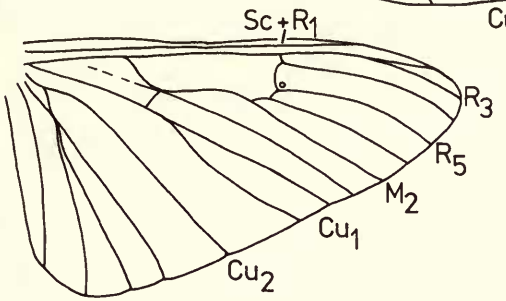

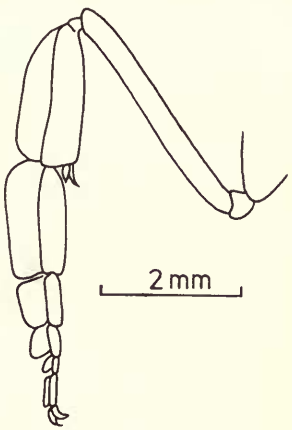

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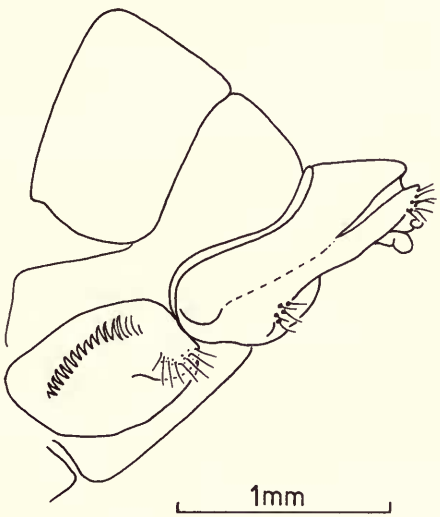

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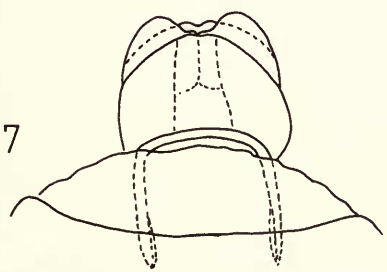

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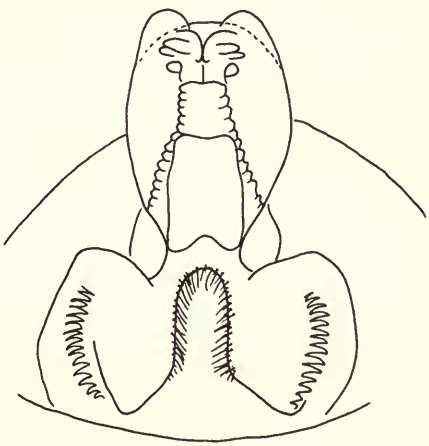

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Figs 14–18 *Oestropsyche vitrina* ♀. 14, wing venation; 15, mid-leg; 16, genitalia, lateral view; 17, genitalia, dorsal view; 18, genitalia, ventral view.

antennal segments shorter and more slender in ♀. Eyes small, not meeting ventrally, slightly larger in ♀ (Figs 20, 25). ♂ mesothoracic legs with tibia and tarsal segments slightly dilated, greatly dilated in ♀ (Fig. 26). Spurs 0.2.2 or 0.3.2. Venation as in Figs 19, 24; a 'false' discal cell, enclosing the corneous spot, formed by R_4 and R_5 rejoining almost immediately after separating. ♂ wings narrow, excised on hind margin (Fig. 19), ♀ wings broader, triangular, hind margin almost straight (Fig. 24).

Most museum specimens of this group are yellowish brown in colour, with black eyes, but a specimen of *A. sexpunctata* in the BMNH bears the description, made at the time of capture by H. T. Pagden, 'Head, thorax, abdomen, legs and wing veins very pale green . . . eyes piceous.'

REMARKS. Kimmins (1962) provisionally synonymized *Paraethaloptera* with *Aethaloptera*, and despite the differences in venation I have here formally synonymized it. The female genitalia of *Paraethaloptera gracilis* (the males being unknown) are almost indistinguishable from those of *Aethaloptera maxima*.

The genus is distributed throughout the Afrotropical region, India, Sri Lanka, South East Asia and Indonesia as far as northern Australia, with one species in the Amur Region of the U.S.S.R. and southern Siberia.

Key to species of *Aethaloptera*

1	Fork R_4 in hind wing stalked (Figs 29, 33)	***maxima*** (p. 72)
–	Fork R_4 in hind wing sessile (Figs 19, 24)	2
2 (1)	Fork R_2 in fore wing slightly shorter than its stem; R_1 fuses apically with *Sc* (Fig. 39)	***gracilis*** (p. 75)
–	Fork R_2 in fore wing longer than its stem; R_1 runs free to wing margin (Fig. 24) . .	3
3 (2)	Tip of ♂ aedeagus only slightly swollen in ventral view (Fig. 23); sclerites of ♀ eighth sternite with outer posterior corners deeply excised (Fig. 27). (African species) . .	***dispar*** (p. 68)
–	Tip of ♂ aedeagus strongly swollen in ventral view (Fig. 37); sclerites of ♀ eighth sternite without deeply excised corners (Figs 38, 45). (Palaearctic and Oriental species) . .	4
4 (3)	♂ wing length 10–12 mm; posterior edges of ♀ eighth sternite straight or slightly curved (Fig. 45). (Indian, Oriental and N. Australian species)	***sexpunctata*** (p. 75)
–	♂ wing length 14–17 mm; posterior edges of ♀ eighth sternite with shallow U-shaped excision (Fig. 38). (Russian and Chinese species)	***evanescens*** (p. 72)

Aethaloptera dispar Brauer
(Figs 19–28)

Aethaloptera dispar Brauer, 1875: 72. LECTOTYPE ♂, SENEGAL: near Taoué, xi.1869 (*Steindachner*) (NM, Vienna), here designated [examined].

Primerenca maesi Navás, 1915: 182. Holotype ♀, ZAIRE: Kwamouth (*Maes*) (MRAC, Tervuren) [not examined]. [Synonymized by Lestage, 1919: 293.]

Primerenca maerina Navás, 1916: 242. [Unjustified emendation.]

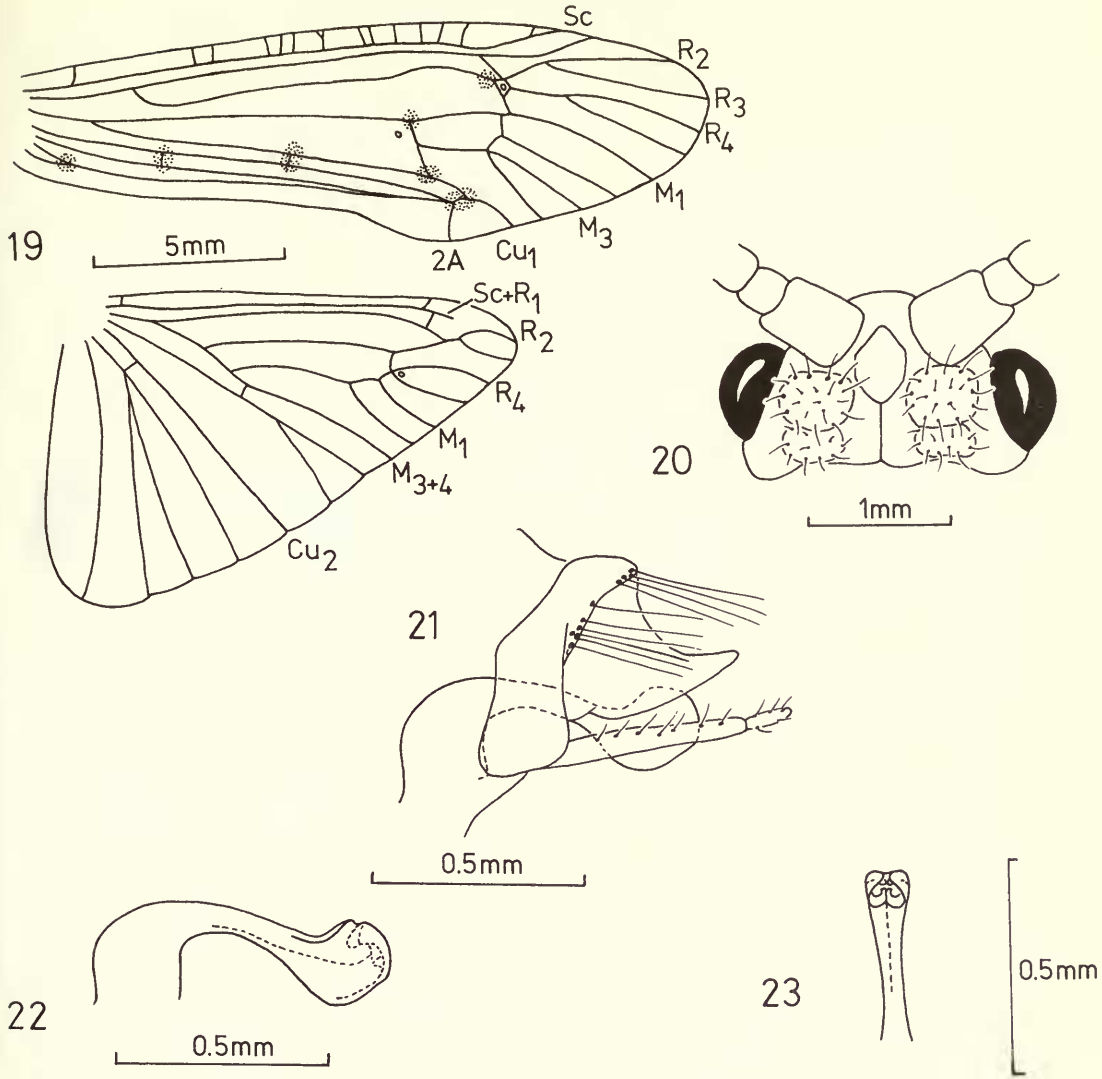
♂. Antennae up to 50 mm, with up to 95 segments. Each segment golden brown, with distinct white annular band near the base. Head and thorax yellowish brown, occasionally greenish, legs yellow, abdomen yellowish brown, darker dorsally. Wings pale green, fading to yellowish brown. Brown spots centred on various cross-veins in fore wing (Fig. 19) but these are variable in number. Wing length 10–15 mm. Spurs 0.3.2. Fork R_4 in hind wing sessile, *Sc* and R_1 in fore wing sinuous apically (Fig. 19).

♀. Antennae up to 10 mm, with 30–35 segments. Coloration as in ♂, except that basal white band on antennal segments is often ill-defined or even absent. Wings broader and shorter than in ♂; wing length 8–10 mm. Spurs and venations similar to male, except that in fore wing fork M_3 is occasionally stalked. *Sc* and R_1 in fore wing straight apically (Fig. 24).

GENITALIA ♂ (Figs 21–23). Ninth tergite slightly produced centrally. Aedeagus with angular projection on ventral surface, internal armature with broad rounded lobes in lateral view.

GENITALIA ♀ (Fig. 27). Plates of eighth sternite with outer posterior corners deeply cut away.

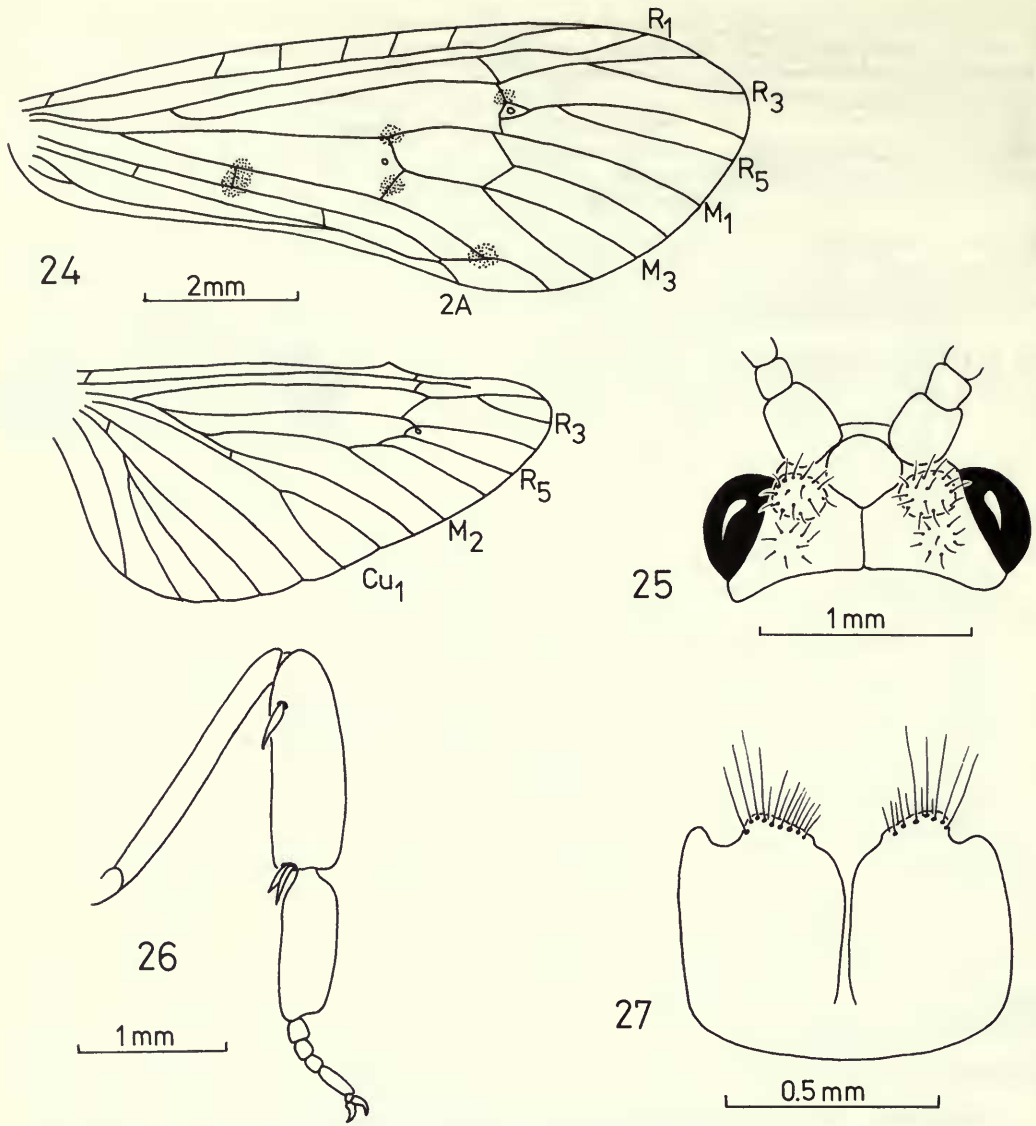
REMARKS. This is a very variable species throughout its range; this variability has prompted several authors to attempt to subdivide it. Lestage (1936) doubted that *'dispar'* was the same



Figs 19–23 *Aethaloptera dispar* ♂. 19, wing venation. 20, head, dorsal view; 21, genitalia, lateral view; 22, aedeagus, lateral view; 23, aedeagus, ventral view.

species throughout Africa, because of variation in the degree of dilation of the female tibiae, and so on. Marlier (1943) stated that there were definitely three groups in Zaire, based on differences in both male and female genitalia, the number of markings on the wings and the colour of the antennal segments. However, he declined to name these forms, although suggesting that *Primerenca maesi* Navás was a valid species. Kimmins (1962) took a rather opposite view, suggesting that not only are both *dispar* and *maxima* variable, but that they may be only local forms of one widespread species.

Only a detailed study of long series of specimens, coupled with examination of larvae from different areas, could help to solve this problem. In the present study I have examined a total of approximately 540 specimens of *dispar*, and I can find no consistent differences sufficient to split the species into discrete groups: indeed there can be as much variation between two specimens caught at the same time at one locality as between examples from the extremes of the



Figs 24–27 *Aethaloptera dispar* ♀. 24, wing venation; 25 head, dorsal view; 26, mid-leg; 27, eighth sternite, ventral view.

geographical range. *A. dispar* and *maxima* have reasonably discrete distributions; both species occur in Angola but in different river basins (see remarks on *A. maxima* below). The two species meet in Zambia at Victoria Falls, but here they can still be separated by the hind wing venation and the spur formulae; the genitalia in both sexes are very similar. Kimmins (1962) reports that males from Malawi (Nyasaland) have the typical venation and spur formula of *dispar* but have genitalia more like *maxima*.

The collection of over 200 specimens, mostly females, from Zaire (listed below) is of some interest, as they were caught at some distance from water. The collector, Dr S. L. Sutton (*in litt.*, 1978) estimates that the trapping site was about 25 km SSW. of Kindu, and 8 km east of the River Lualaba, a headwater of the Zaire River. There is another river, the Kasuku, about 3 km

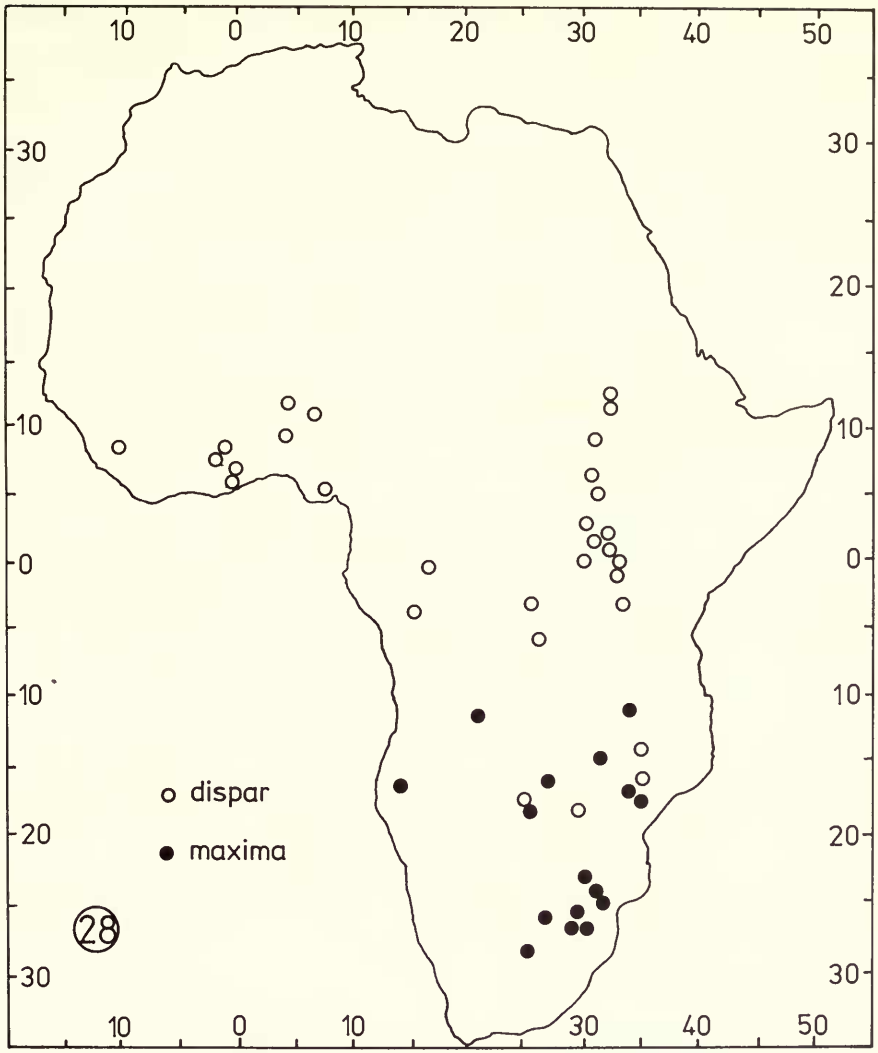


Fig. 28 Distribution map of *Aethaloptera dispar* and *A. maxima*.

to the west, but the only nearer water was a slow, shallow stream (at most 3 cm deep) about 1 km away. Fourteen other species of Trichoptera were caught at the same site.

DISTRIBUTION (Fig. 28). Senegal, Sierra Leone, Ivory Coast (Marlier, 1978), Ghana, Nigeria, Zaire, Sudan, Uganda, Tanzania, Angola (Marlier, 1965), Zambia, Malawi, Zimbabwe. Also recorded from Madagascar by Navás (1923*b*) although this is not confirmed.

MATERIAL EXAMINED

Senegal: 1 ♂, 2 ♀, near Taoué, xi.1869 (*Steindachner*) (NM, Vienna) (paralectotypes of *dispar*). **Sudan:** 4 ♂, 1 ♀, White Nile, L. Loat, 1906 (BMNH); 1 ♀, 1914 (*Lowe*) (BMNH); 2 ♀, El Jebelain, 3–4.xii.1961; 1 ♂, Renk, 4–7.xii.1961; 3 ♂, 6 ♀, Malakal–Shambe, 8.xii.1961; 1 ♂, 1 ♀, Mongalla–Malakal, 24–27.xii.1961 (*Cloudsley–Thompson*) (BMNH). **Sierra Leone:** 1 ♂, 6 ♀, Njala, 2.iv.1926, 2.vi.1926, 19–21.viii.1930, 17.iii.1932, 1.iv.1932, vi.1934 (*Hargreaves*) (BMNH). **Ghana:** 2 ♂, 1 ♀, Afram R., Mankrong, 13.ix.1950 (*Berner*) (BMNH); 2 ♀, Sunyani, 12–13.xii.1965 (*Gibbs*) (BMNH); 3 ♀, Tafo, 9–13.x.1966 (*Gibbs*) (BMNH); 6 ♂, Black Volta, 1967 (*Petr*) (BMNH). **Nigeria:** 4 ♀, Birnin Kebbi, 3.xi.1957 (BMNH); 1 ♀, Oban District, 1910 (*Talbot*) (BMNH); 11 ♀, Samaru, 18–25.v., 1–8.ix.1970 (*Ward*) (BMNH); 1 ♀, Zaria, Samaru,

26.ix.1970 (*Deeming*) (BMNH); 9 ♀, Lake Kainji, 1975 (*Bidwell*) (BMNH). **Zaire:** 2 ♂, 1900 (*Andreae*) (BMNH); 1 ♂, 4 ♀, Kabalo, v.1926 (*Schouteden*) (BMNH); 1 ♂, Gombe, 27.ii.1949 (*Marlier*) (MRAC, Tervuren); 1 ♂, Leopoldville [Kinshasa], at light, ii.1949 (*Marlier*) (MRAC, Tervuren); 1 ♂, Tshuapa, Lukolela, 13.viii. 1947 (*Poll*) (MRAC, Tervuren); 10 ♂, *c.* 200 ♀, Sciere, near Kindu, xi.1974 (*Sutton*) (BMNH). **Uganda:** 1 ♂, Lake George, xi.1920 (*Carpenter*) (BMNH); 2 ♂, Lake Albert, iii.1931 (*Hopkins*) (BMNH); 1 ♂, Jinja, iv.1952 (USNM, Washington); 2 ♂, 4 ♀, 2–24.v.1954 (*Hickin*) (BMNH); 8 ♂, 90 ♀, W. Nile, near Laropi, 27–28.iv.1956, 18 ♂, 75 ♀, Albert Nile, Pakwach, 26–29.iv.1956 (*Corbet*) (BMNH); 3 ♂, 8 ♀, Victoria Nile, L. Kyoga, near Namasale, 1.v.1956 (*Corbet*) (BMNH); 2 ♀, Kawanda, Kampala, 20–29.viii.1969 (*Brown*) (BMNH). **Tanzania:** 4 ♀, Old Shinyanga, 4.v.1954, 2–7.iii.1956 (*Burtt*) (BMNH); 1 ♀, Lake Victoria, Mwanza Pier, 11–13.viii.1956 (*Corbet*) (BMNH). **Zambia:** 12 ♂, 4 ♀, Zambezi River, Katambora, iv.1962 (*Pinhey*) (BMNH). **Malawi:** 2 ♂, Chiromo, 2.xii.1923 (*Smee*) (BMNH); 5 ♂, Ntundu, 7.viii.1952 (*Berner*) (BMNH). **Zimbabwe:** 1 ♂, Zambezi River, Victoria Falls, 9.vii.1962 (*Mason*) (AM, Grahamstown); 2 ♂, Victoria Falls, xii.1955–i.1956 (USNM, Washington); 2 ♂, 2 ♀, Victoria Falls National Park, 3–6.iv.1968 (*Spangler*) (USNM, Washington); 1 ♀, Gatooma, iv.1956 (USNM, Washington).

Aethaloptera maxima Ulmer
(Figs 28–34)

Aethaloptera maxima Ulmer, 1906: 62. NEOTYPE ♂, South Africa: Waterval River, National Road between Standerton and Greylingstad, 12.i.1959 (ZM, Hamburg), here designated [examined].
Chloropsyche maxima (Ulmer) Ulmer, 1907: 16.
Aethaloptera maxima Ulmer; Weidner, 1964: 66 [♂ holotype destroyed].
[*Aethaloptera dispar* Brauer, forma A; Marlier, 1965: 40. Misidentification.]

♂. Antennae up to 45 mm long, with up to 80 segments. Wing length 14–17 mm. Antennal segments golden brown, without annulations, otherwise as *A. dispar*. Spurs 0.2.2. Venation as in ♂ *dispar* except that in hind wing fork R_4 is stalked (Fig. 29).

♀. Antennae 15 mm long with approximately 45 segments. Wing length 9–15 mm. Posterior warts on head scarcely developed. Antennal segments golden brown with basal third to half white. Spurs 0.2.2. Venation as in ♀ *dispar* except that fork R_4 in hindwing is stalked (Fig. 33).

Genitalia ♂ (Figs 30–32). Very similar to *dispar*, differing slightly in the internal armature of the aedeagus.

Genitalia ♀ (Fig. 34). Similar to *dispar* but with the outer posterior corners of the eighth sternite less deeply excised. Kimmins (1962) discusses the differences in genitalia between *dispar* and *maxima*.

Remarks. The relationship of this species with *A. dispar* is discussed under the latter species. Marlier (1965) recorded *maxima* from Angola as a form ('forma A') of *dispar*, but the spur formula (0.2.2) and his figure of the female genitalia show that the specimens can undoubtedly be referred to *maxima*. They were collected in eastern Angola, in the Zambezi basin, and this does not unduly extend the known distribution (Fig. 28).

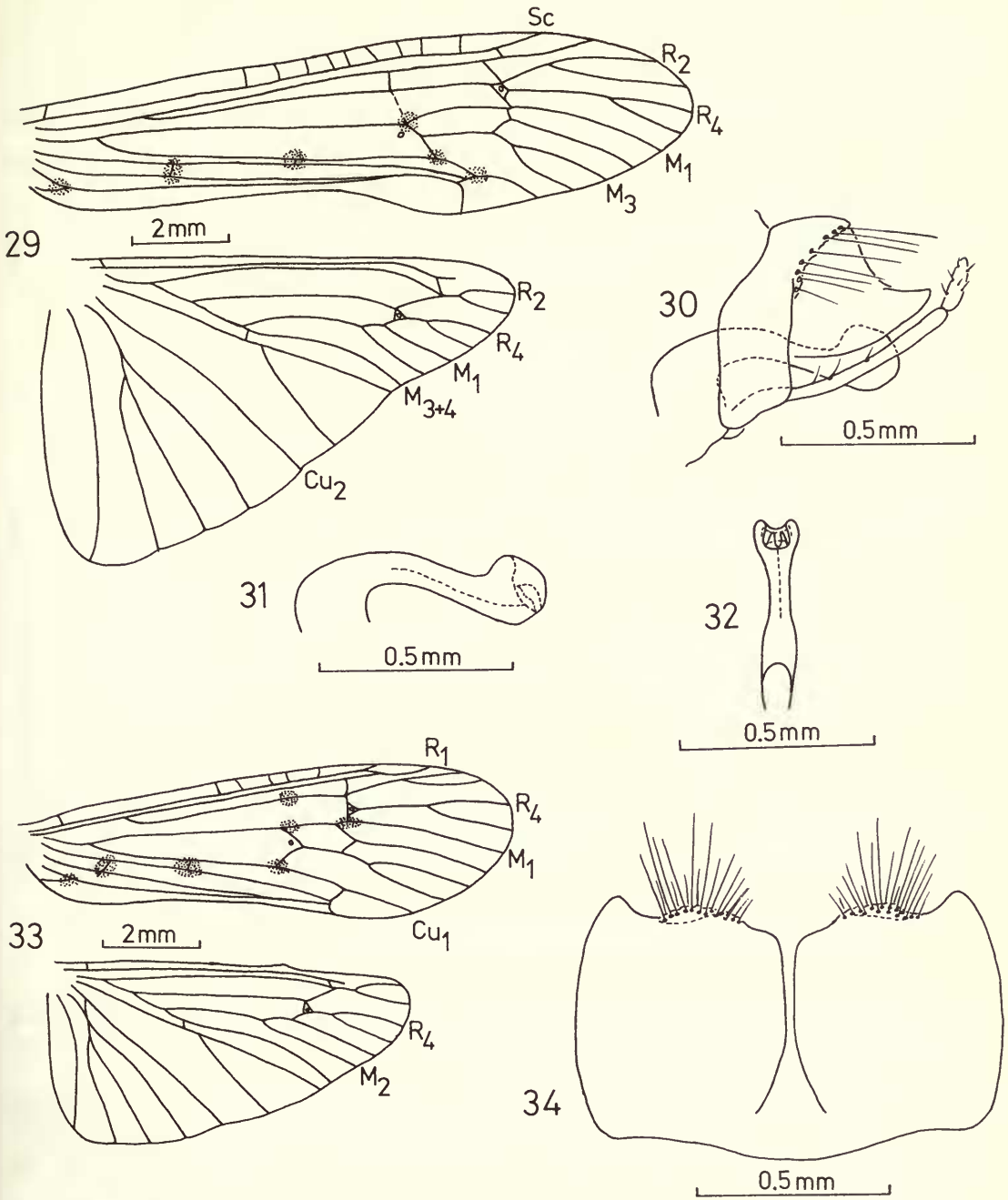
Distribution (Fig. 28). Angola (Marlier, 1965), Namibia, South Africa, Zimbabwe, Mozambique, Zambia.

Material examined

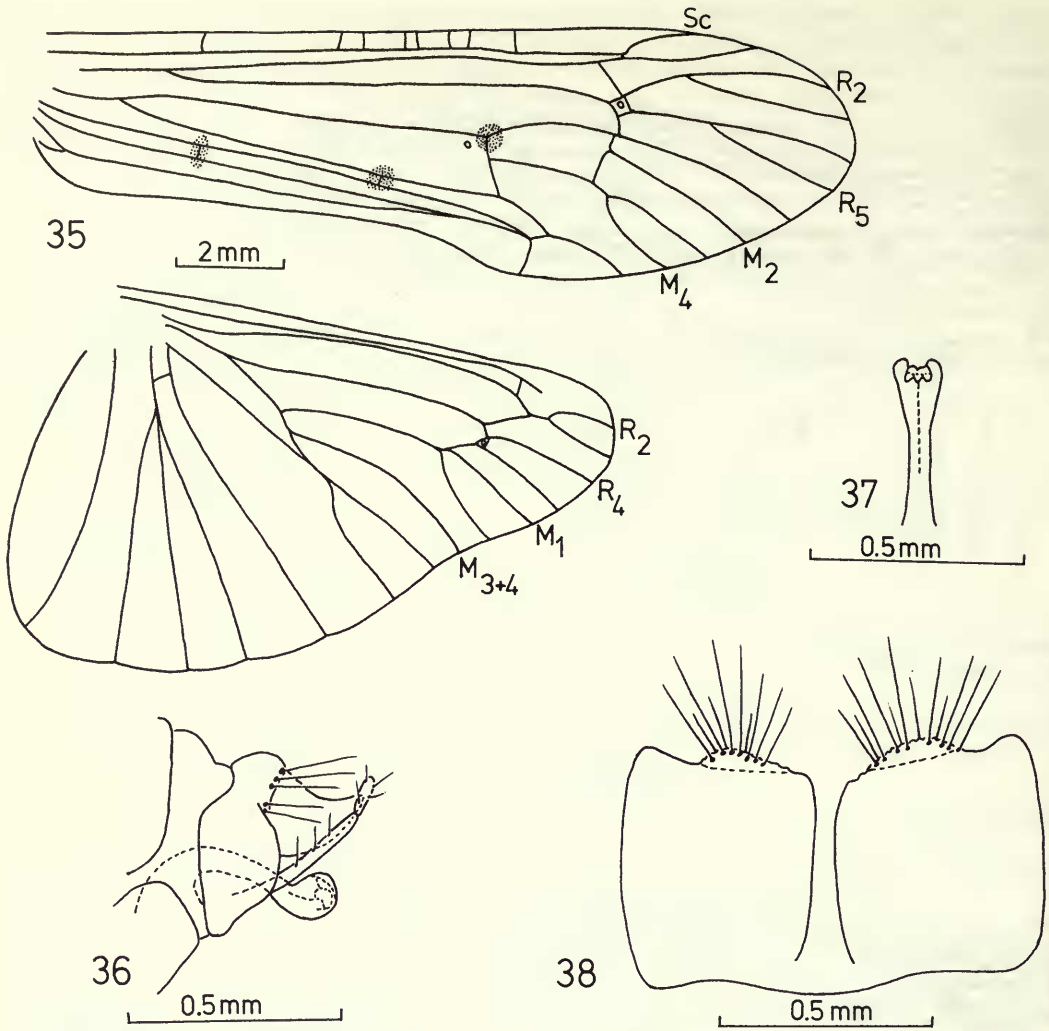
South Africa: 2 ♂, data as neotype (BMNH); 1 ♀, Boshof, 7.i.1921 (BMNH); 2 ♀, Wilge River, Frankfort, 9.ii.1959 (BMNH); 4 ♂, 4 ♀, Transvaal, Standerton, at light, 23.iii.1960 (AM, Grahamstown); 7 ♂, 5 ♀, Frankfort, at light, 18.iii.1965 (*Chutter*) (AM, Grahamstown); 4 ♀, Kruger National Park, Olifants Camp, 19.ii.1968; 3 ♀, Pretoriuskop, 20–21.ii.1968; 1 ♀, Transvaal, Mooketsi, 14–18.ii.1968 (*Krombein & Spangler*); 2 ♀, Transvaal, Potchefstroom, 1.iii.1968 (*Spangler*) (USNM, Washington). **Namibia:** 1 ♂, 1 ♀, Otjimbumbe, Kunene River, iii. 1923 (*Barnard*) (BMNH). **Zimbabwe:** 1 ♂, Zambezi River, Victoria Falls, 9.v.1962 (*Mason*) (AM, Grahamstown). **Mozambique:** 12 ♀, Caia, Zambezi River, 29.viii.1929 (*Marshall*) (BMNH); 1 ♂, Garé, 13.vii.1929 (*Lesne*) (BMNH); 4 ♂, Nova Choupanga, near Chemba, v.1928, iv.1929 (*Lesne*) (BMNH). **Zambia:** 1 ♂, Upper Luangwa River, 27.vii.–13.viii.1910; 1 ♂, Lower Luangwa River, 4–13.ix.1910 (*Neave*) (BMNH); 19 ♂, Chipepo, from tiger fish stomachs, 25.x.1956 (BMNH).

Aethaloptera evanescens (McLachlan)
(Figs 35–38)

Chloropsyche evanescens McLachlan, 1880: 69. Lectotype ♂, U.S.S.R.: 'Amur Land' (*Christoph*) (BMNH), designated by Kimmins (1957: 105) [examined].



Figs 29–34 *Aethaloptera maxima*. 29, ♂ wing venation; 30, ♂ genitalia, lateral view; 31, aedeagus, lateral view; 32, aedeagus, ventral view; 33, ♀ wing venation; 34, ♀ eighth sternite, ventral view.



Figs 35–38 *Aethaloptera evanescens*. 35, ♂ wing venation; 36, ♂ genitalia, lateral view; 37, aedeagus, ventral view; 38, ♀ eighth sternite, ventral view.

Aethaloptera rossica Martynov, 1910: 385. Syntypes ♂, ♀, U.S.S.R.: 'Ussurian Amur Land and S. Siberia to River Ob'' (? ZI Leningrad) [not examined]. **Syn. n.**
Aethaloptera evanescens (McLachlan) Kimmins, 1962: 96.

♂. Antennae up to 40 mm long, with approximately 75 segments. Wing length 14–17 mm. Antennal segments golden brown with basal third white. Head and thorax yellowish brown, legs pale yellow. Abdomen yellowish brown ventrally, slightly darker dorsally. Usually three brown spots on fore wing (Fig. 35) but these may be reduced in number or absent. Spurs 0.2.2. or 0.3.2. Venation as in *A. dispar* (Fig. 35).

♀. Antennae 10–12 mm long, with up to 40 segments. Wing length 10 mm. Coloration and spurs as ♂, venation as in ♀ *dispar*.

GENITALIA ♂ (Figs 36, 37). Ninth segment very narrow ventrally, gonopods slender. In ventral view, aedeagus strongly enlarged apically with square-edged excision.

GENITALIA ♀ (Fig. 38). Eighth sternite with a shallow U-shaped excision at the outer posterior corners.

REMARKS. Martynov (1934: 305) suspected that his species *rossica* was a synonym of *evanescens*,

as it was only separable by the spur formula, which was then considered a generic character to separate *Aethaloptera* and *Chloropsyche*. Kimmins (1962) has synonymized these genera as the spur formula is unreliable, so the synonymy of the two species is inevitable. I have not examined the Martynov types, which are presumably in the ZI, Leningrad, but the series in the BMNH from the Rivers Ob' and Ussuri were determined as *rossica* by Martynov. An examination of this series showed that the pre-apical spur of the mesothoracic leg varied from being very long to very short, and was absent in two specimens, thus emphasizing the variability of this character.

DISTRIBUTION. U.S.S.R. (Amur Region, S. Siberia), S. and E. China.

MATERIAL EXAMINED

China: 1 ♂, 1 ♀, Fu-chou (*Yang*); 1 ♂, Pai-se, Kwangsi, 29.iii.1939 (*Richardson*). **U.S.S.R.:** 3 ♂, Amur Region, Raddefka [= Radde, on Amur River]; 4 ♂, River Ob', Tomsk, 6.vii.1925 (*Filipjev*); 2 ♂, R. Ussuri, Bikin, 9.vii.1927 (*Martynov*). (All specimens in BMNH.)

Aethaloptera gracilis (Martynov) **comb. n.**
(Figs 39, 40)

Paraethaloptera gracilis Martynov, 1935: 193. 4 ♀ syntypes, INDIA: Sanjai River, Chakradharpur, Chota Nagpur, 8–10.ii.1918 (*Annandale & Gravely*) (IM, Calcutta) [not examined].

♂. Unknown

♀. Antennae up to 10 mm long, with about 35 segments. Wing length 8–10 mm. Antennal segments golden brown, proximal half yellowish white. Head, thorax and abdomen yellowish brown, legs yellow. Wings yellowish brown with up to four brown spots (Fig. 39) which may be reduced or absent. In fore wing, fork R_2 is shorter than its stalk; in both wings R_1 fuses apically with *Sc* (Fig. 39). Spurs 0.2.2.

GENITALIA ♀ (Fig. 40). Eighth sternite with a moderately deep excision on the outer posterior corners.

REMARKS. I was unable to borrow the syntypes of this species, but Martynov's (1935) figures of the distinctive venation make it instantly recognizable. Because of the similar distribution, it is possible that *gracilis* specimens are dimorphic females of *sexpunctata*, but the peculiar venation makes this unlikely.

DISTRIBUTION. India, Sri Lanka.

MATERIAL EXAMINED

India: 1 ♀, Alagar Kovil, Madura District, 17.iii.1936 (BMNH); 1 ♀, New Delhi, at light, 29.xi.1967 (*Gibson*) (USNM, Washington). **Sri Lanka:** 1 ♀, Uggalkaltota, 350′ [105 m], 31.i–8.ii.1970; 2 ♀, Sigiriya, 800′ [240 m], 25.ii.1970 (*Davis & Rowe*) (USNM, Washington).

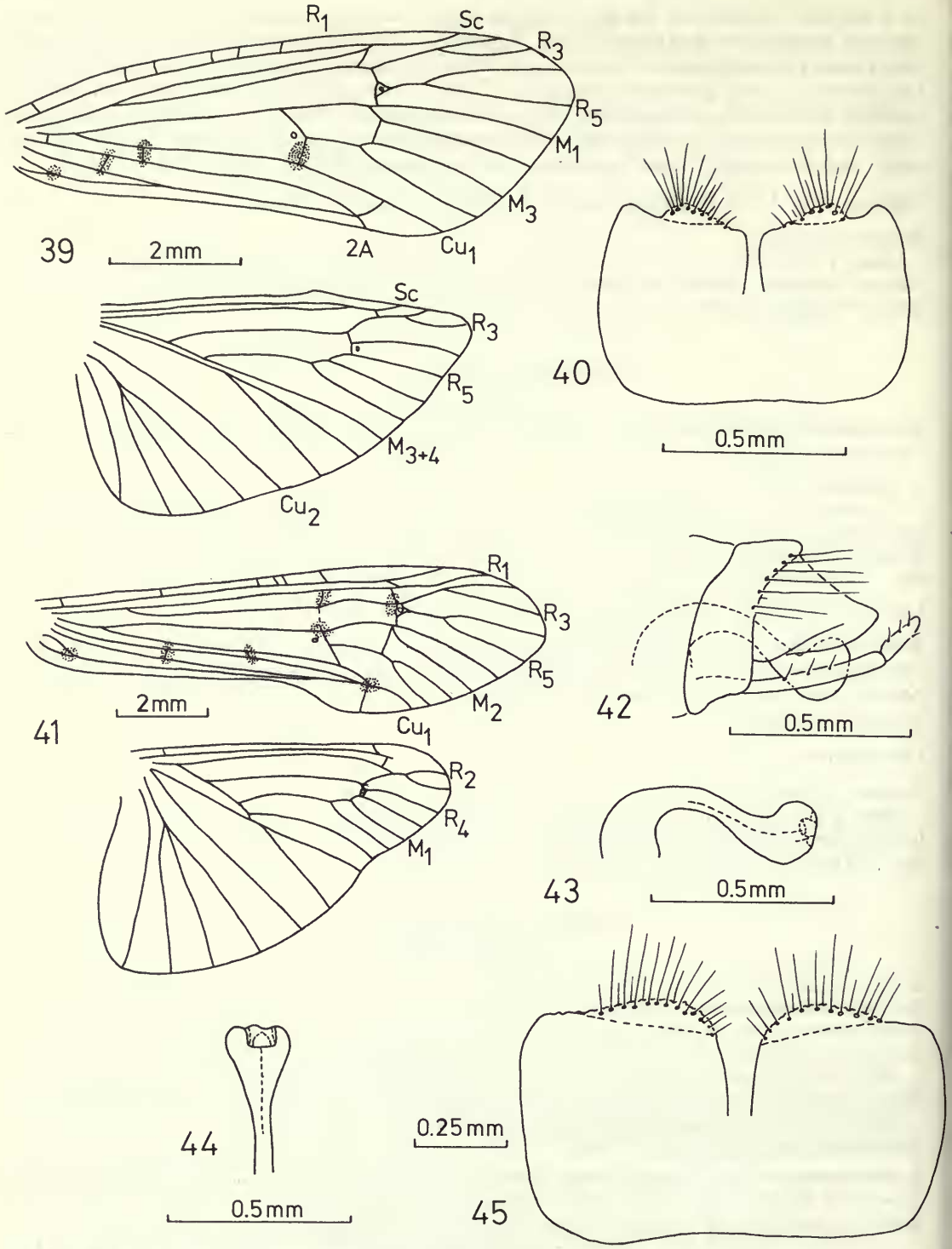
Aethaloptera sexpunctata (Kolenati)
(Figs 41–46)

Setodes sexpunctata Kolenati, 1859: 266. Holotype ♂, INDIA (*Hügel*) (NM, Vienna) [examined].
Polymorphanisus sexpunctatus (Kolenati) Brauer, 1868: 263.
Aethaloptera sexpunctata (Kolenati) Ulmer, 1907: 19.
Aethaloptera dyakana Banks, 1920: 354. Holotype ♀, BORNEO: Duson Timoc, v.1882 (*Grabowsky*) (type no. 10885, MCZ, Harvard) [examined]. [Synonymized by Ulmer, 1951: 194.]
Paraethaloptera punctata Banks, 1938: 232. LECTOTYPE ♀, WEST MALAYSIA: Negri Sembilan, Port Dickson, 10.i.1935 (*Pendlebury*) (BMNH), here designated [examined]. **Syn. n.**
Aethaloptera punctata (Banks) Kimmins, 1962: 96.

♂. Antennae up to 35 mm long, with about 70 segments. Wing length 10–12 mm. Antennal segments golden brown with proximal third white. Head, thorax and abdomen yellowish brown, legs pale yellow. Wings greenish or yellowish, with up to seven brown spots (Fig. 41). Spurs 0.3.2.

♀. Antennae 10 mm long, with about 40 segments. Wing length 8–11 mm. Coloration as in ♂. Spurs 0.3.2.

GENITALIA ♂ (Figs 42–44). Aedeagus greatly expanded in ventral view to form two rounded lobes with a flatter lobe between.



Figs 39–45 39, 40, *Aethaloptera gracilis* ♀, (39) wing venation; (40) eighth sternite, ventral view. 41–45, *A. sexpunctata,* (41) ♂ wing venation; (42) ♂ genitalia, lateral view; (43) aedeagus, lateral view; (44) aedeagus, ventral view; (45) ♀ eighth sternite, ventral view.

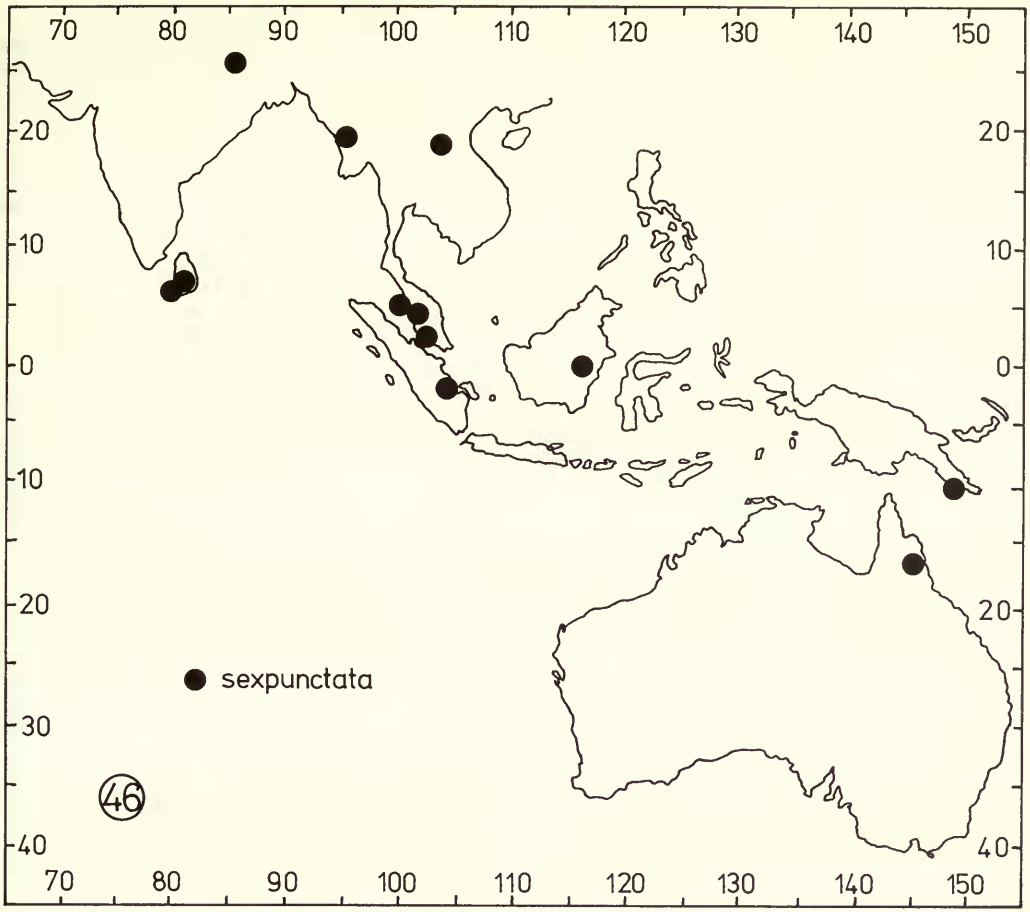


Fig. 46 Distribution map of *Aethaloptera sexpunctata*.

GENITALIA ♀ (Fig. 45). Posterior margin of each half of eighth sternite almost straight, slightly serrated towards mid-line.

REMARKS. In his original description, Kolenati (1859) described the presence of brown spots on the posterior cubitus, arculus and thyridium, making six spots on the two fore wings combined, hence the specific name *sexpunctata*. As described above, most specimens have more spots, often up to seven, on each wing. The male holotype does in fact have four spots on each wing; Kolenati apparently overlooked the anal spot.

Kimmins's (1962) 'type' of *punctata* Banks is so labelled by Banks but is not distinguished in his description. This specimen is therefore designated the lectotype. Banks (1938) also refers to specimens from Selangor, Kuala Lumpur, but the location of this material is unknown; these would be further paralectotypes (the two females from this locality in the BMNH do not agree with the dates cited by Banks). Other specimens from Port Dickson in the BMNH were determined by Banks as *sexpunctata*, thus supporting the synonymy.

The discovery of *A. sexpunctata* in N. Queensland is the first record of the tribe Polymorphanisini in Australia.

DISTRIBUTION (Fig. 46). India, Sri Lanka, Burma, Laos, Cambodia (Ulmer, 1926), West Malaysia, Sumatra (Ulmer, 1951), Borneo (Ulmer, 1930), New Guinea, Australia (Queensland).

MATERIAL EXAMINED

India: 2 ♂, NW. India (*Horne*) (BMNH); 14 ♂, Bihar, Pusa, various dates and collectors (BMNH). **Sri Lanka:** 1 ♂, Maha Oya, 12.iii.1954 (*Schmid*) (USNM, Washington); 2 ♂, Hasalaka, 1000′ [300 m], at light, 30–31.iii.1973 (*Baumann & Cross*) (USNM, Washington). **Burma:** 9 ♂, Prome, at light, 17–18. ii.1918 (BMNH). **Laos:** 1 ♂, Pakkading, 4.v.1932 (*Kerr*) (BMNH).

West Malaysia: 2 ♀, Penang, Tanjong Bungah, at light, 11.iv.1955 (*Pagden*); 1 ♀, Lahat, 1916 (*Henderson*); 2 ♀, Selangor, Kuala Lumpur, at light, 9.ii., 30.ix.1931 (*Pendlebury*); 5 ♀, Negri Sembilan, Port Dickson, various dates (*Pendlebury*); 1 ♀, data as lectotype (paralectotype of *punctata* Banks). **New Guinea:** 1 ♀, Papua New Guinea, Port Moresby, 1887 (*Kowald*). (All specimens in BMNH.)

Australia: 1 ♀, Queensland, 20 miles [32 km] W. of Tully, 20. iv.1964 (*Common & Upton*) (BMNH) [first record for Australia].

POLYMORPHANISUS Walker

Polymorphanisus Walker, 1852: 78. Type-species: *Polymorphanisus nigricornis* Walker, by monotypy.
Oestropsis Brauer, 1868: 263. Type-species: *Oestropsis semperi* Brauer, by monotypy. [Synonymized by Ulmer, 1907: 19.]

Head with one pair of setigerous warts on vertex with a transverse ridge posteriorly on each side (Fig. 52). Antennae up to twice wing length, similar in both sexes. Mesothoracic legs of ♂ with tibia and tarsal segments slightly broadened, very broad in ♀. Spurs 1.3.2, 1.3.3 or 2.3.3. Venation as in Figs 47, 120; *Sc* and R_1 in fore wing terminate separately on wing margin. In hind wing of *ocularis*-group R_1 ends on *Sc*; R_{2+3} fused.

REMARKS. It is possible that future work will show that the two species groups of *Polymorphanisus* deserve generic status. The *ocularis*-group particularly has many derived characters such as the enlarged male eyes, the unsegmented gonopods, and so on. However, there are also several features which unit the two groups, particularly venational characters and the unusual wing-coupling mechanism. Further larval descriptions will probably elucidate the relationship of the two groups as at present the larvae of the *ocularis*-group are unknown.

The genus is distributed throughout the Afrotropical region, and from India through south East Asia to Indonesia, including the Philippines.

Key to species of *Polymorphanisus*

1		In fore wing M_1 is closely associated at base with R_5; M_2 is direct continuation of M_{1+2} stem (Fig. 47). ♂ eyes well separated ventrally. (***nigricornis*-group**)	2
–		In fore wing M_1 is direct continuation of M_{1+2} stem; M_2 arises from median cell (Fig. 120). ♂ eyes almost touching ventrally (Fig. 122). (***ocularis*-group**)	16
2	(1)	African species	3
–		Asian species	6
3	(2)	Thorax unmarked	4
–		Thorax with two spots on mesoscutellum (Figs 58–71)	5
4	(3)	Antennal flagellum dark brown or black, with dark stripe on scape (Fig. 75) ***hargreavesi*** (p. 87)	
–		Antennae yellow ***marlieri*** (p. 87)	
5	(3)	Mesoscutellar spots small and round (Fig. 48). Antennae brown in ♂, black in ♀ ***bipunctatus*** (p. 81)	
–		Mesoscutellar spots elongate (Figs 58–71). Antennae yellow ***elisabethae*** (p. 81)	
6	(2)	Thorax unmarked	7
–		Thorax with one or more dark spots	9
7	(6)	Fork R_2 in fore wing shorter than its stalk (Fig. 110) ***taoninus*** (p. 95)	
–		Fork R_2 longer than or equal to its stalk (Fig. 111)	8
8	(7)	Antennae, fore femora and tibiae pale yellowish brown (basal antennal segments sometimes with a narrow, longitudinal, dark brown stripe) ***astictus*** (p. 79)	
–		Antennae, fore femora and tibiae dark brown. ***umbripes*** (p. 95)	
9	(6)	Mesoscutellum unmarked. Two large spots anteriorly on mesoscutum and two on metascutum (Fig. 94). ***quadripunctatus*** (p. 90)	
–		Mesoscutellum with one, two or four spots	10
10	(9)	Two spots on mesoscutellum (Fig. 105)	11

–	One or four spots on mesoscutellum (Figs 85, 87, 118)	14
11 (10)	Thoracic spots large and oval, meeting sides of mesoscutellum (Fig. 102)	***scutellatus*** (p. 92)
–	Thoracic spots not touching sides of mesoscutellum (Fig. 105)	12
12 (11)	Head greatly swollen anteriorly (Fig. 112). Mesoscutellar spots narrow and elongate, widened posteriorly	***tumidus*** (p. 95)
–	Head not swollen. Mesoscutellar spots not widened posteriorly	13
13 (12)	Mesoscutellar spots elongate (Fig. 105). ♂ fore wings falcate (Fig. 104)	***semperi*** (p. 92)
–	Mesoscutellar spots small and round (Fig. 91). ♂ fore wings not falcate	***nigricornis*** (p. 90)
14 (10)	Thorax with single spot in centre of mesoscutellum (Fig. 118).	***unipunctus*** (p. 96)
–	Thorax with more than one spot (Figs 85, 87).	15
15 (14)	Wings dark brown. Thorax with one large spot on mesoscutellum and two smaller squarish spots anteriorly on metascutum (Fig. 85)	***fuscus*** (p. 84)
–	Wings pale yellowish brown or greenish. Mesoscutellum with four small round spots (Fig. 87)	***muluensis*** (p. 87)
16 (1)	Fore wing with no brown spots	***angustipennis*** (p. 98)
–	Fore wing with one or two brown spots (Figs 131, 133)	17
17 (16)	Fore wing with only one spot (Fig. 133).	***guttatus*** (p. 98)
–	Fore wing with two spots (Fig. 131)	18
18 (17)	♂ gonopods abruptly narrowed half-way (Fig. 129). Outer posterior corners of ♀ eighth sternite sloping evenly towards outer edge (Fig. 132). (African species)	***similis*** (p. 103)
–	♂ gonopods slightly widened in centre (Fig. 136). Outer posterior corners of ♀ eighth sternite produced in rounded lobes (Fig. 138). (Indian and Oriental species)	***ocularis*** (p. 100)

The *nigricornis*-group

Dark green or yellowish brown species, often with black markings on thorax. Wings long and narrow, without brown markings (except *P. fuscus*). Antennae about twice forewing length. Eyes small, well separated ventrally in male. Spurs usually 1.3.3, in some species 1.3.2. In fore wing M_2 is direct continuation of M_{1+2} stem; in hind wing R_1 terminates on wing margin. ♂ gonopods long and slender, terminal segment well defined.

Polymorphanisus astictus Navás
(Figs 79–83)

Polymorphanisus astictus Navás, 1923*a*: 47. LECTOTYPE ♂, China: Kweichow, P'ing-Fa, 1908 (*Cavalerie*) (MNHN, Paris), here designated [examined].

Polymorphanisus hainanensis Martynov, 1930: 82. Holotype ♂, China: Hainan Tao I., Mt Wuchih Shan, 20.v.1903 (BMNH) [examined]. **Syn. n.**

Polymorphanisus flavipes Banks, 1939: 53. Holotype ♀, India: Mysore, Shimoga, River Tunga, 1865′ [560 m], at light, 10.vi.[? year] (*Nathan*) (type no. 23467, MCZ, Harvard) [examined]. **Syn. n.**

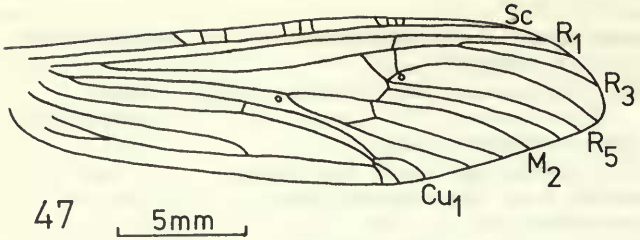
♂. Antennae up to 45 mm, with about 65 segments. Antennal segments yellow, basally brown, distal segments yellowish brown. Body yellowish brown, wings pale greenish yellow or yellowish brown. No markings on thorax. Wing length 19–23 mm, venation as in Fig. 79. Spurs 1.3.3.

♀. Antennae up to 50 mm, with up to 80 segments. Scape, pedicel and first flagellar segment sometimes with thin black stripe externally, but all segments may be yellow as in ♂. General coloration as ♂. Wing length 18–28 mm. Spurs 1.3.3.

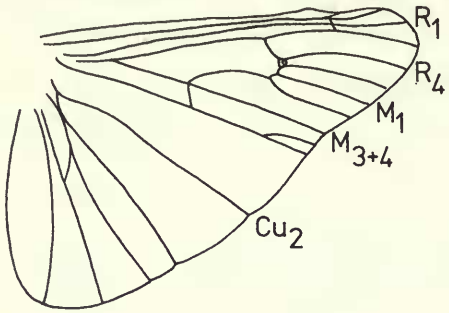
Genitalia ♂ (Figs 80–82). Gonopods long and narrow. Ninth segment produced into a spatulate lobe, viewed dorsally. Aedeagus with swollen round tip, with small, oval cavity at tip.

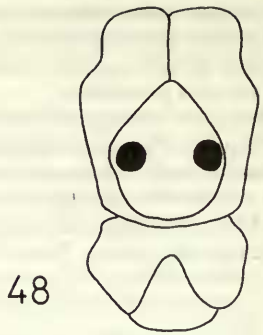
Genitalia ♀ (Fig. 83). Outer posterior corners of eighth sternite slightly produced as rounded lobes; outer margins of sternite slightly sinuate.

Remarks. Banks (1939) seems to have confused this species with some of its allies. He erroneously states that it belongs in the *indicus-ocularis* group; Ulmer (1951: 178) has pointed out that this is incorrect. In the same paper Banks described *flavipes*, comparing it with what he believed to be Walker's species *nigricornis*, but he was misled by Walker's failure to notice the mesoscutellar markings (see *umbripes*, p. 95). Banks also noted two specimens of *flavipes* with yellowish wings and black spots each side of the mesonotum. I have examined all of Banks's material of this species; the two specimens with yellow wings are males of *flavipes* (i.e. *astictus*)

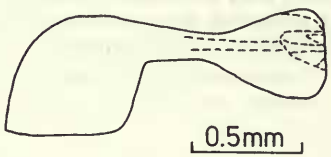


47 5mm

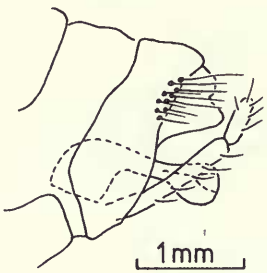




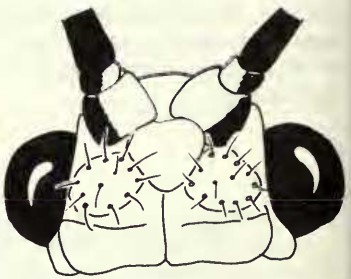
48 5mm



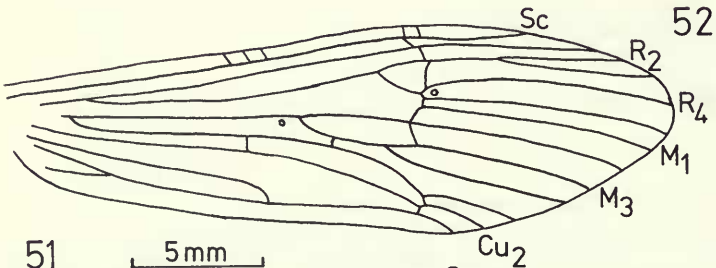
50 0.5mm



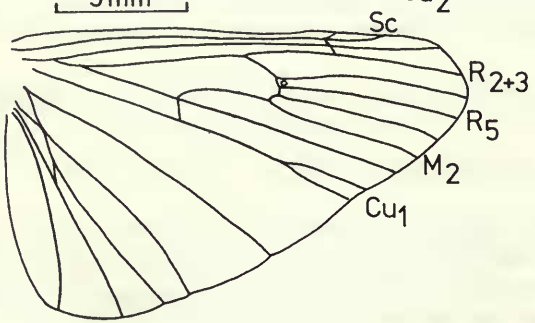
49 1mm

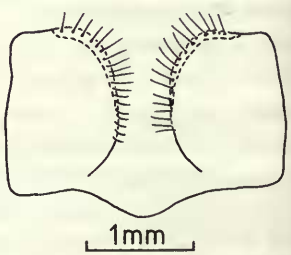


52 1mm



51 5mm





53 1mm

Figs 47–53 *Polymorphanisus bipunctatus*. 47, ♂ wing venation; 48, ♂ thorax; 49, ♂ genitalia, lateral view; 50, aedeagus, lateral view; 51, ♀ wing venation; 52, ♀ head, dorsal view; 53, ♀ eighth sternite, ventral view.

but the two with 'black' markings are females with the normal yellowish brown wing colour. The markings are simply abnormally dark attachment points of the flight muscles showing through the mesonotum.

DISTRIBUTION. India (Mysore), China, Thailand, West Malaysia.

MATERIAL EXAMINED

India: 3 ♂, 34 ♀, data as holotype of *flavipes*, various dates; 12 ♀, Mysore, Bhadravati (*Nathan*). (All specimens in MCZ, Harvard: all apparently paratypes of *flavipes* but not labelled as such.) **China:** 1 ♂, Hainan Tao I., Mt Wuchih Shan, 12.v.1903 (paratype of *hainanensis*). **Thailand:** 1 ♂, Upper Pran R., 14.iv.1926 (*Ladell*). **West Malaysia:** 1 ♂, Pahang, Kuala, Tahan, at light, 300′ [90 m], 23.xi.1921 (*Pendlebury*); 1 ♀, Kedah, nr Jitra, 5.iv.1928 (*Pendlebury*); 1 ♀, Selangor, Ulu Langat, at light, 31.viii.1934 (*Pendlebury*). (All specimens in BMNH.)

Polymorphanisus bipunctatus (Brauer)
(Figs 47–53, 72)

Oestropsis bipunctatus Brauer, 1875: 73. LECTOTYPE ♀, ETHIOPIA: Beni Sciangul, Blue Nile, 1871 (*Marno*) (NM, Vienna), here designated [examined].
Polymorphanisus bipunctatus (Brauer) Ulmer, 1907: 20.

♂. Antennae up to 40 mm, with up to about 70 segments. Scape and pedicel yellowish brown, flagellar segments brown with dark annulation at each joint. Body colour yellowish brown. Thorax with one pair of round black spots on mesoscutellum (Fig. 48). Wings pale green, fading to yellowish brown. Wing length 22–26 mm. Venation as in Fig. 47. Spurs 1.3.3.

♀. As ♂, except as follows. Scape and pedicel of antennae with black longitudinal stripe on outer side, flagellum black (Fig. 52). Wing length 20–28 mm. Venation as in Fig. 51. Spurs 1.3.3, occasionally 2.3.3.

GENITALIA ♂ (Figs 49, 50). Terminal segment of gonopod short and wide. Ratio of lengths of basal segment of gonopod to terminal segment 2.6–2.9:1. Ninth segment relatively broad ventrally, rounded dorsally.

GENITALIA ♀ (Fig. 53). Inner posterior corners of eighth sternite strongly rounded; thickened edges extending almost half-way along inner side. Outer corners almost right-angled.

REMARKS. Betten & Mosely (1940) regarded this species as almost certainly a synonym of *nigricornis*. In view of the widely differing distribution it would seem best to regard them as separate, at least until their larvae have been described (the same would apply to *ocularis* and *similis* in the *ocularis*-group). *P. bipunctatus* can be separated from *nigricornis* by the relative lengths of the segments of the gonopods.

The Angolan specimen listed below is presumably from the south or east of that country, in the Zambezi basin (cf. *Aethaloptera maxima*, p. 72).

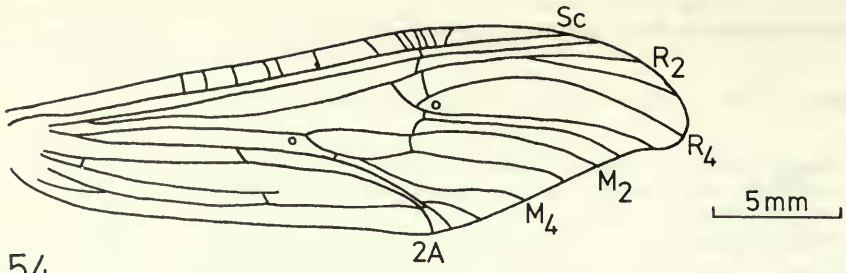
DISTRIBUTION (Fig. 72). Sudan, Ethiopia, Kenya, Angola, Zimbabwe, South Africa.

MATERIAL EXAMINED

Sudan: 1 ♂, Senga [Singa], Blue Nile, 30.xii.1914 (*Lowe*); 1 ♂, Zeidab, 15.xi.1918 (*Bedford*); 1 ♀, Shendi, 31.x.1928 (*Cowland*); 2 ♂, nr mouth of Dinder River, Blue Nile, 26.vii.1909 (*Flower*); 1 ♂, White Nile. (All specimens in BMNH.) **Ethiopia:** 1 ♀ paralectotype, data as lectotype (NM, Vienna). **Kenya:** 2 ♀, Nzoia River, Lwamba Ferry, 19–20.iv.1956 (*Corbet*) (BMNH). **Angola:** 1 ♀ (BMNH). **Zimbabwe:** 1 ♂, Victoria Falls, i.1956 (USNM, Washington). **South Africa:** 1 ♀, Transvaal, Elandshoek, at light, 16.xi.1946 (*Capener*) (BMNH); 3 ♀, Natal, Ndumu Reserve, 1–10.xii.1963; 1 ♂, Natal, Tugela River, 9.x.1953; 4 ♀, Natal, Mooi River, 20.xii.1940 (*Crass*) (AM, Grahamstown).

Polymorphanisus elisabethae Navás
(Figs 54–56, 58–72)

Polymorphanisus elisabethae Navás, 1931*a*: 140. Holotype ♀ [not ♂, as stated by Navás], ZAIRE: Malela, viii.1928 (*Queen Elisabeth*) (MRAC, Tervuren) [examined].
Polymorphanisus bipunctatus pupillatus Navás, 1931*a*: 139. Holotype ♂, ZAIRE: Bokote, 22.xii.1925 (*Hulstaert*) (MRAC, Tervuren) [examined]. **Syn. n.**
[*Polymorphanisus bipunctatus* (Brauer) Marlier, 1961: 208. Misidentification.]
Polymorphanisus pupillatus Navás; Marlier, 1965: 77.
[*Polymorphanisus bipunctatus* (Brauer); Marlier, 1965: 40. Misidentification.]



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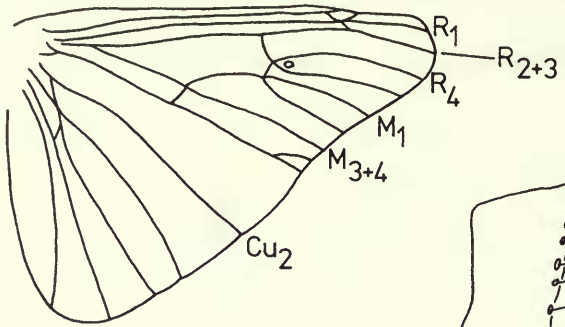

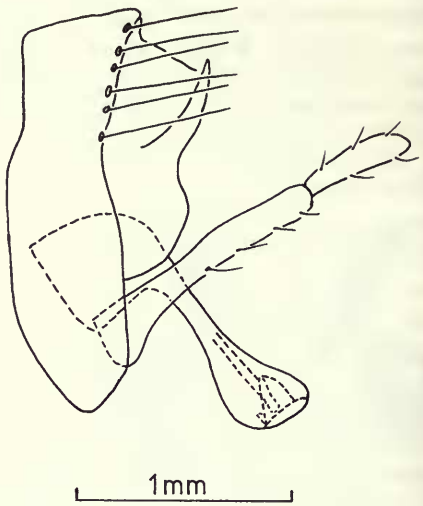

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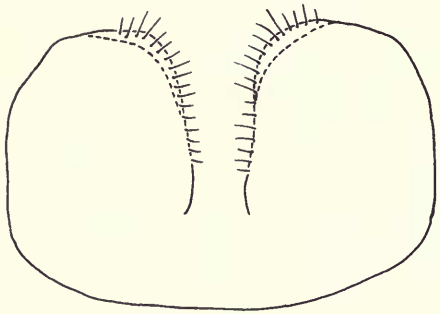

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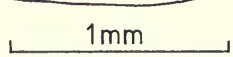

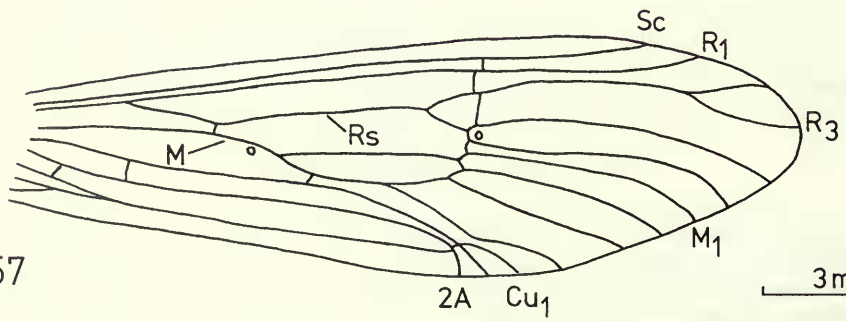

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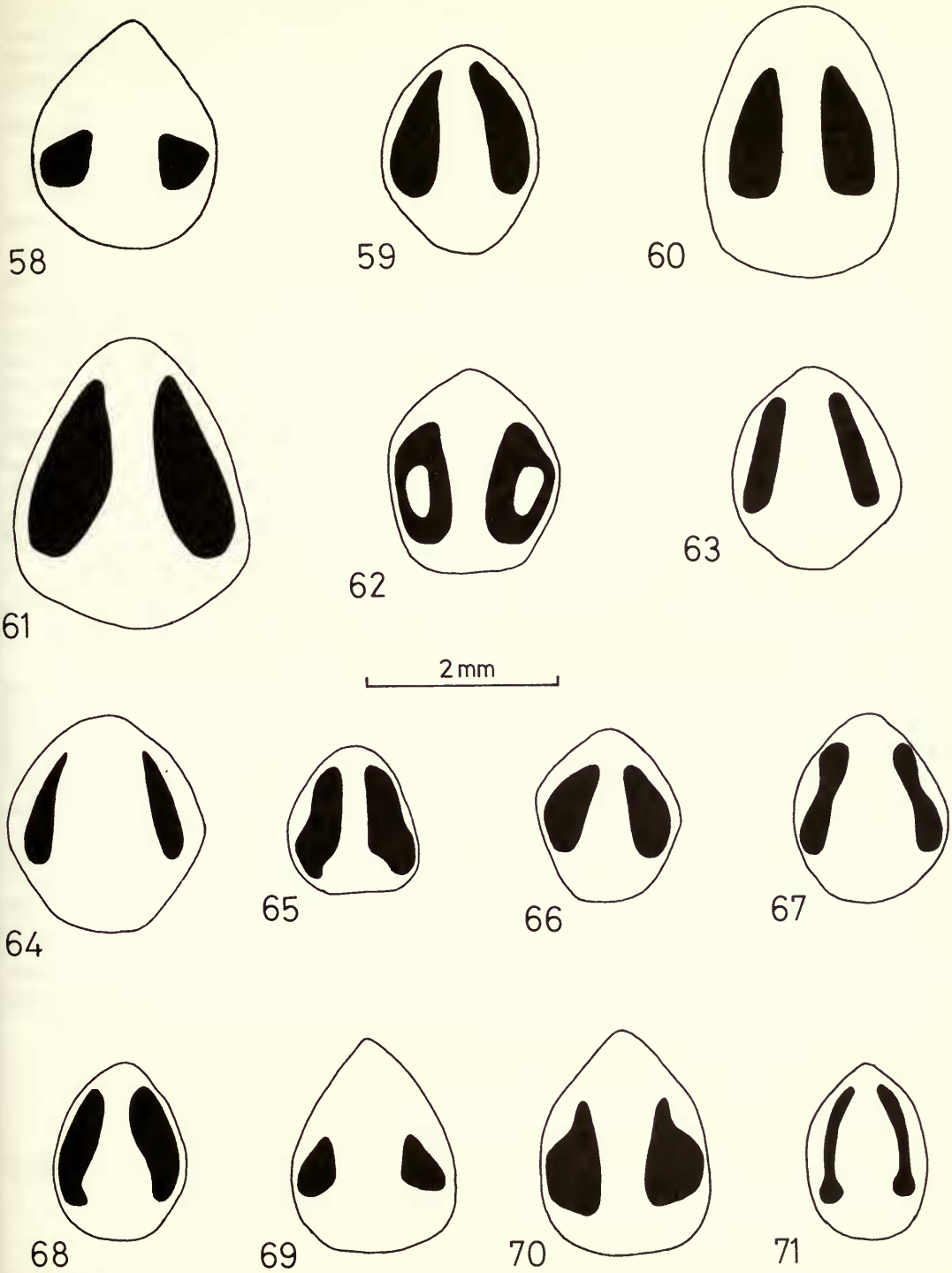
Figs 54–57 54–56, *Polymorphanisus elisabethae*, (54) ♂ wing venation; (55) ♂ genitalia, lateral view; (56) ♀ eighth sternite, ventral view. 57, *Synoestropsis* sp. ♂ fore wing.



Figs 58–71 Variation in thoracic markings of *Polymorphanisus elisabethae*. 58, ♀, Zaire, Kivu; 59, ♂, Albertville; 60, ♂, Sierra Leone; 61, ♀ holotype of *elisabethae*; 62, ♂ holotype of *pupillatus*; 63, ♀, Zaire, Popokabaka; 64–66, ♀, Ibembo; 67, ♀, Kivu; 68, ♀, Lulonga; 69, 70, ♀, ♂, Bilomba; 71, ♀, Zambia.

♂. Antennae up to 70 mm, with up to 75 segments. Scape and pedicel yellowish brown, flagellar segments golden brown, with a dark line at each joint. Body yellowish brown, abdomen darker brown dorsally. Thorax with a pair of elongate spots, varying greatly (Figs 58–71; ♂, ♀) but never round. Wing length 15–26 mm. Wings slightly falcate (Fig. 54), pale green to yellowish brown, with golden brown streaks apically along the branches of *R* and *M*; extreme wing tip often dark brown. Spurs 1.3.3 or 2.3.3.

♀. Antennae up to 45 mm, otherwise as ♂. Wings less obviously falcate than in ♂, being shorter and broader. Wing length 16–20 mm. Spurs 1.3.3 or 2.3.3.

GENITALIA ♂ (Fig. 55). Similar to *bipunctatus*, armature of aedeagus with enlarged external opening.

GENITALIA ♀ (Fig. 56). Outer corners of eighth sternite rounded; inner thickened edges extending less than half-way.

REMARKS. This species has caused great confusion to previous authors on account of its great variability, as well as being confused with *bipunctatus*. Navás (1931*a*: 139) described the variety *pupillatus* as a form of *bipunctatus*, not realizing that it was a form of his own species *elisabethae* described in the same paper! Lestage (1936) recognized that all variations in the form of the thoracic spots could occur, including their disappearance, and Barnard (1934) made similar comments about *bipunctatus* (in the present paper forms lacking thoracic markings are recognized as valid species). Marlier (1965) took an opposite view, grouping specimens with similar markings into 'forms' of *bipunctatus*. These are in fact forms of *elisabethae*, and Figs 58–71 show the enormous variability of these thoracic markings, even in specimens from the same locality. I do not think that there is any possibility of subdividing this species in any meaningful way, and even Navás's *pupillatus* is here considered to fall within the range of variation, despite Marlier's (1965) elevation of it to a full species.

DISTRIBUTION (Fig. 72). Sierra Leone, Ghana, Nigeria, Cameroun, Congo (Marlier, 1965), Zaire, Uganda, Zambia, Zimbabwe.

MATERIAL EXAMINED

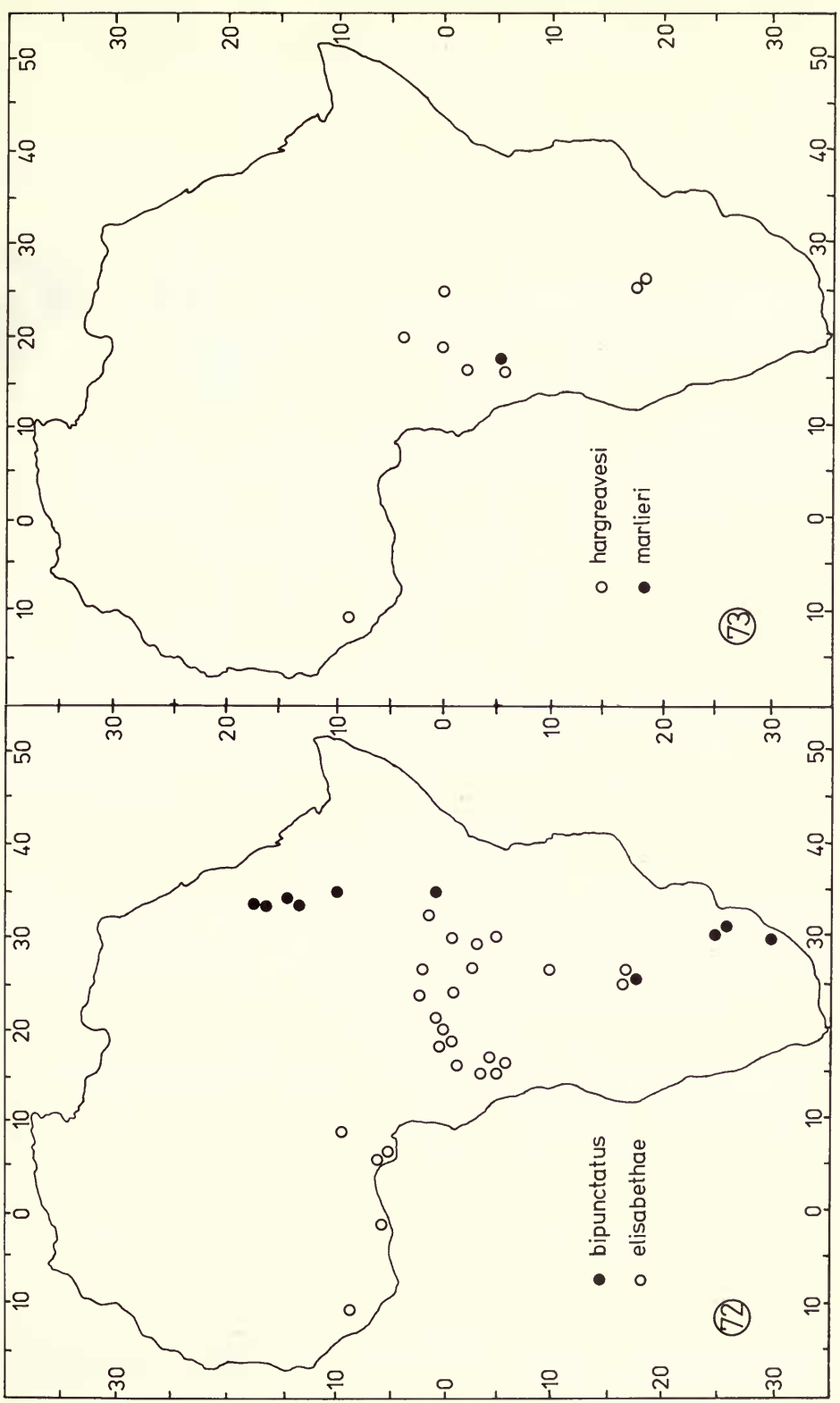
Sierra Leone: 5 ♂, 11 ♀, Njala, various dates (*Hargreaves*) (BMNH). **Ghana:** 1 ♀, Wassaw District, 45 miles [72 km] inland from Sekondi (BMNH). **Nigeria:** 1 ♀, Lagos, 6 miles [9.6 km] NW. of Agege, at light, 24.ii.1973 (*Riley*) (BMNH); 1 ♀, Kagoro Forest, 15–17.x.1971 (*Deeming*) (BMNH); 2 ♀, Benin, 8.iv.1973 (*Medler*) (BMNH). **Cameroun:** 1 ♀ (*Rosevear*) (BMNH). **Zaire:** 1 ♀, 150–200 miles [240–320 km] W. of Kambove, 3500–4000′ [1050–1200 m], 28.ix.1907 (*Neave*) (BMNH); 1 ♀, Tshuapa, Bamania, x.1951 (*Hulstaert*); 3 ♀, Uele, Ibembo, 30.vi.1950, x–xi.1951, ii.1952 (*Hutsebaut*); 1 ♂, Albertville [Kalemie], 3.i.1919 (*Mayne*); 1 ♀, Mayumbe forest, 29.iii.1973 (*Allaer*); 1 ♀, Kivu, Lubero 950 m, xii.1956 (*Célis*); 1 ♀, Mayumbe, Vaku, 22.v.1970 (*Elsen*); 1 ♀, Kimwenza, ix.1962 (*Deheegher*); 1 ♀, Kwango, Popokabaka, iii.1952 (*Pierquin*); 1 ♀, Lulonga, 22.ii.1949 (*Marlier*); 1 ♀, Irangi, River Luhoho, 8–10.i.1957 (*Leleup*), 2 ♀, 24.xii.1957 (*Marlier*); 1 ♀, 1 ♂, Bilomba, Kamituga, 25.viii.1950 (*Marlier*); 2 ♀, Bolobo–Lukolela, 10.vi.1951 (*Marlier*); 1 ♂, Mombongo, 29.vi.1951 (*Marlier*); 2 ♀, Kisangani, 1.vii.1951 (*Marlier*); 1 ♂, Meko, Bolobo, nr Tshumbiri, 9.vi.1951 (*Marlier*); 5 ♂, 1 ♀, Lukanga, at light, 7.vi.1955 (*Marlier*); 1 ♂, Ikela, ix.1959 (*Leleup*); 1 ♀, Shabunda, Kiamiseke, at light, 27.x.1954 (*Leleup*) (all in MRAC, Tervuren). **Uganda:** 3 ♂, 1 ♀, Karuma Falls, Victoria Nile (*Corbet*) (BMNH). **Zambia:** 2 ♀, Katombora, Zambezi River, iv.1962 (*Pinhey*) (BMNH). **Zimbabwe:** 1 ♂, 1 ♀, Victoria Falls, i.1956 (USNM, Washington).

Polymorphanisus fuscus (Ulmer)
(Figs 84–86)

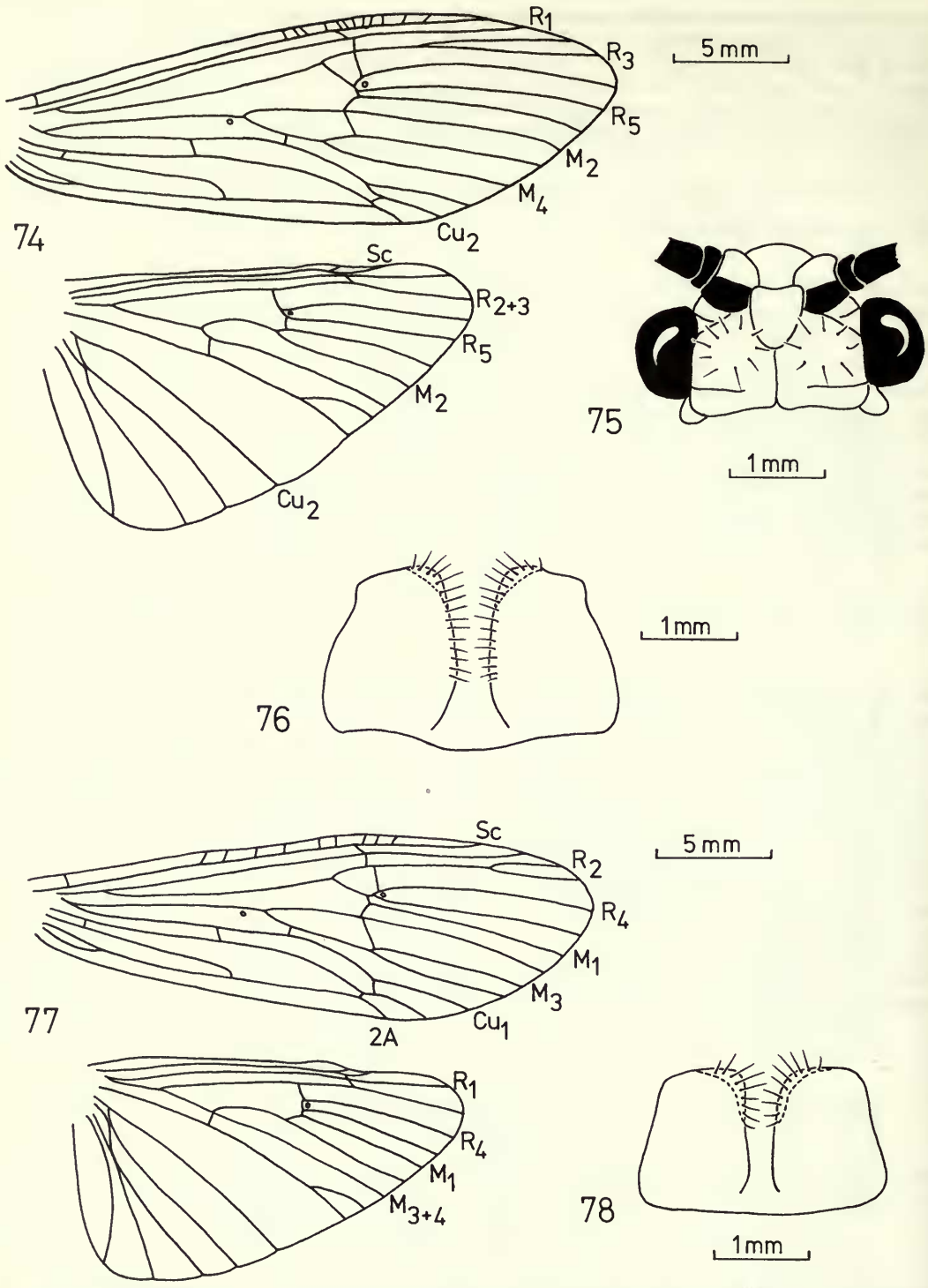
Oestropsis fusca Ulmer, 1905*a*: 42. Holotype ♀, SUMATRA: Soekaranda [? Soekaradja] (*Dohrn*) (type no. 1753, IZPAN, Warsaw) [examined].
Polymorphanisus fuscus (Ulmer) Ulmer, 1905*b*: 31.
Oestropsis fusca Ulmer; Tomaszewski, 1961: 4. [Holotype depository.]

♂. Unknown.

♀. Antennal length unknown (all specimens damaged). Antennal segments golden brown, with dark joints. Body pale yellowish brown. Thorax with two oblong, black markings on mesonotum; mesoscutellum almost covered by large oval spot (Fig. 85). Wings dark smoky brown with blackish brown spot near base of costa on fore wing (Fig. 84). Wing length 24–26 mm. Spurs 1.3.3.



Figs 72, 73 Distribution maps. 72, *Polymorphanisus bipunctatus* and *P. elisabethae*; 73, *P. hargreavesi* and *P. marlieri*.



Figs 74–78 74–76, *Polymorphanisus hargreavesi* ♀, (74) wing venation; (75) head, dorsal view; (76) eighth sternite, ventral view. 77, 78 *P. marlieri* ♀, (77) wing venation; (78) eighth sternite, ventral view.

GENITALIA ♀ (Fig. 86). Sides of eighth sternite tapering posteriorly, outer corners broadly rounded.

REMARKS. Even though the male is unknown, this species is one of the most distinctive of the genus, with its characteristic dark brown wings and the markings on the thorax and wing base.

DISTRIBUTION. Sumatra, Borneo (Sarawak).

MATERIAL EXAMINED

Borneo: 4 ♀, Sarawak, Gunong Mulu National Park, at light, ii–iii.1978 (*Holloway et al.*) (BMNH).

Polymorphanisus hargreavesi sp. n.
(Figs 73–76)

♂. Unknown.

♀. Antennae up to 45 mm, with about 65 segments. Scape yellowish brown, with longitudinal black stripe (Fig. 75), pedicel and flagellum dark brown or black. Body yellowish brown, abdomen dark brown dorsally, wings pale yellowish brown. No markings on thorax. Wing length 22–28 mm. Venation as in Fig. 74. Spurs 1.3.3.

GENITALIA ♀ (Fig. 76). Outer posterior corners of eighth sternite produced into sharp points.

REMARKS. This species is readily distinguished from *bipunctatus* and *elisabethae* by the lack of thoracic markings, and from *marlieri* by the dark antennae. The specimens examined show a discontinuous distribution, with a long series from Sierra Leone, and scattered individuals from Zaire, Zambia and Zimbabwe. Although I am reasonably certain of the identity of these latter specimens, I am restricting the type-series to the Sierra Leone material.

DISTRIBUTION (Fig. 73). Sierra Leone, Zaire, Zambia, Zimbabwe.

MATERIAL EXAMINED

Holotype ♀, **Sierra Leone:** Njala, 22.x.1930 (*Hargreaves*) (BMNH).

Paratypes. 11 ♀, data as holotype, various dates (BMNH).

Material excluded from paratype series. **Zaire:** 1 ♀, 1926 (*Jackson*) (BMNH); 2 ♀, Lulonga, 22.ii.1949 (*Marlier*); 1 ♀, Ubangi, 11.viii.1947 (*Poll*); 3 ♀, Kwango, Popokabaka, iii.1952 (*Pierquin*); 1 ♀, Bolobo, 27.vii.1930 (*Beheyu*); 1 ♀, Zaire River, Is. Kui, Stanleyville [Kisangani], 1.vii.1951 (*Marlier*); 1 ♀, Meko, Bolobo, 9.vi.1951 (*Marlier*); all in MRAC, Tervuren. **Zambia:** 1 ♀, Katombora, iv.1962 (USNM, Washington). **Zimbabwe:** 1 ♀, Victoria Falls, xii.1938 (USNM, Washington).

Polymorphanisus marlieri sp. n.
(Figs 73, 77, 78)

♂. Unknown.

♀. Antennae 45 mm long, with approximately 75 segments. Antennal segments pale yellow, with brown annulations at joints. Body and wings yellowish brown, no markings on thorax. Wing length 22, 26 mm (two specimens only). Venation as in Fig. 77, fork R_2 in fore wing shorter than, or just equal in length to, stem. Spurs 1.3.3.

GENITALIA ♀ (Fig. 78). Outer corners of eighth sternite rounded, outer sides slightly sinuous.

REMARKS. This species is named after Dr G. Marlier in recognition of his valuable work on the African Trichopteran fauna. The lack of thoracic markings and the pale antennae distinguish it from other African species, its nearest relative probably being *hargreavesi* sp. n., with dark antennae.

DISTRIBUTION. (Fig. 73). Zaire.

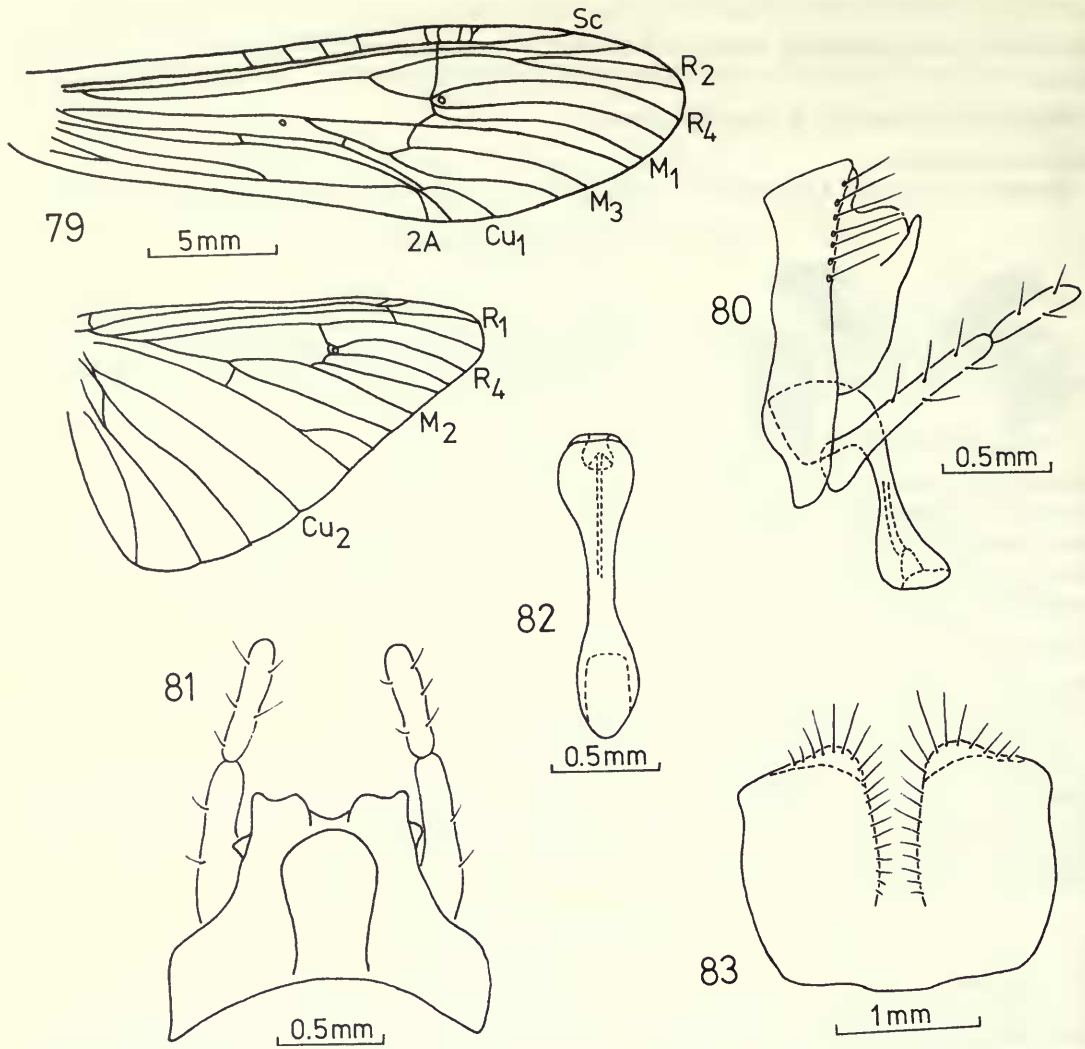
MATERIAL EXAMINED

Holotype ♀, **Zaire:** Feshi, Kwango, R. Kwenge, iv.1959 (*Leleup*) (MRAC, Tervuren).

Paratype. **Zaire:** 1 ♀, Feshi, R. Kwenge, 850 m, at light, ii.1959 (*Leleup*) (BMNH).

Polymorphanisus muluensis sp. n.
(Figs 87–90)

♂. Antennae 40 mm long, with up to 70 segments. Antennal segments pale golden yellow, with dark brown joints. Body yellowish brown, thorax with two pairs of black markings on the mesoscutellum, the anterior



Figs 79–83 *Polymorphanisus astictus*. 79, ♂ wing venation; 80, ♂ genitalia, lateral view; 81, ♂ genitalia, dorsal view; 82, aedeagus, ventral view; 83, ♀ eighth sternite, ventral view.

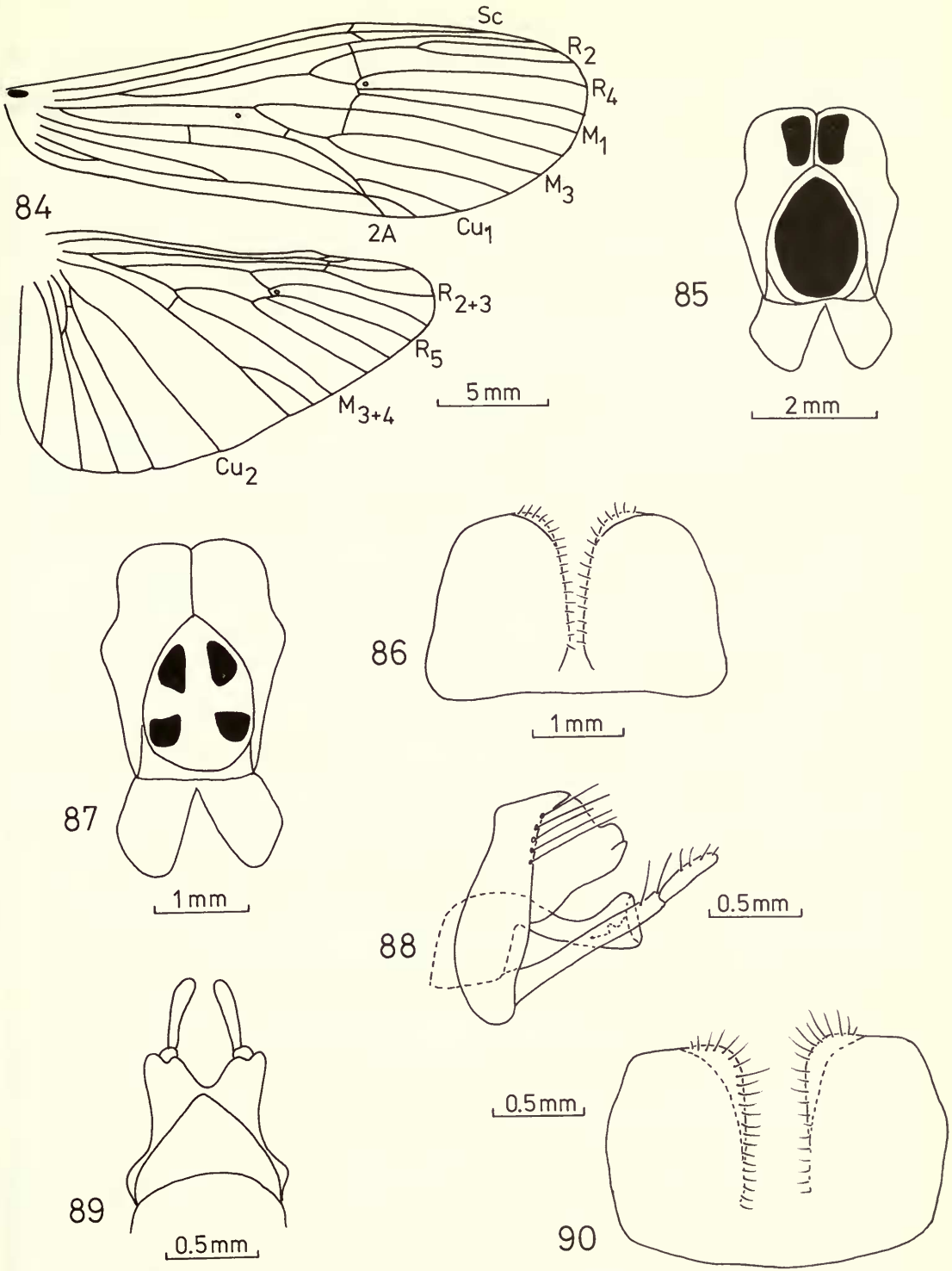
pair subtriangular, the posterior subquadrangular (Fig. 87). Estimated wing length 16 mm, venation probably typical of *nigricornis*-group (specimen damaged). Spurs 1.3.2.

♀. General appearance as ♂, antennae and wings damaged. Estimated wing length 17 mm. Spurs 1.3.3.

GENITALIA ♂ (Figs 88, 89). Tenth segment divided medially, each half with a double lobe, viewed dorsally. Terminal segment of gonopod with clubbed tip, viewed dorso-ventrally.

GENITALIA ♀ (Fig. 90). Thickened inner edges of eighth sternite extend over half-way down segment. Outer edges of sternite with definite obtuse angle.

REMARKS. This species is probably most closely related to *scutellatus*. In the female paratype the mesoscutellar markings are slightly more elongate medially, and rather resemble the form of *scutellatus* from Borneo figured by Ulmer (1951: pl. 10, fig. 224). I think that the differences in female genitalia (the males of *scutellatus* being unknown) are sufficient to warrant describing it as distinct.



Figs 84–90 84–86, *Polymorphanisus fuscus* ♀, (84) wing venation; (85) thorax, dorsal view; (86) eighth sternite, ventral view. 87–90, *P. muluensis*, (87) ♂ thorax, dorsal view; (88) ♂ genitalia, lateral view; (89) ♂ genitalia, dorsal view; (90) ♀ eighth sternite, ventral view.

DISTRIBUTION. Borneo (Sarawak).

MATERIAL EXAMINED

Holotype ♂, **Borneo:** Sarawak, Gunong Mulu National Park, i.1978 (*Holloway et al.*) (BMNH).

Paratype. **Borneo:** 1 ♀, Sarawak, Gunong Mulu National Park, at light, ii.1978 (*Holloway et al.*) (BMNH).

Polymorphanisus nigricornis Walker
(Figs 91–93)

Polymorphanisus nigricornis Walker, 1852: 79. Holotype ♂, INDIA: north (*Stevens*) (BMNH) [examined].
Polymorphanisus nigricornis Walker; Betten & Mosely, 1940: 212. [Redescription of holotype.]

♂. Antennae up to 50 mm long, with about 80 segments. Scape and pedicel yellowish brown, flagellum dark brown. Body and wings yellowish brown or greenish in fresh specimens. Thorax with two small, rounded, black spots on mesoscutellum (Fig. 91). Wing length 22–23 mm. Spurs 1.3.3.

♀. Antennae up to 45 mm long, with about 65 segments. Scape and pedicel with longitudinal black stripe externally, flagellum dark brown or black (as in *bipunctatus*, Fig. 52). Rest of coloration as ♂. Wing length 20–29 mm. Spurs 1.3.3.

GENITALIA ♂ (Fig. 92). Similar to *bipunctatus* and *elisabethae*; terminal segment of gonopod long and narrow. Ratio of lengths of basal and terminal segments of gonopod 1.8–2.3:1.

GENITALIA ♀ (Fig. 93). Eighth sternite tapering strongly posteriorly; outer posterior corners produced sharply.

REMARKS. Much of the confusion over this species has resulted from Walker's (1852) inadequate, and even misleading, description. Walker failed to notice the thoracic markings, which are partly obscured by the pin through the holotype, and he also described the male antennae as black, rather than brown. Betten & Mosely (1940) corrected these errors, but not before several authors such as Ulmer (1907) and Banks (1939) had misidentified the species. Fischer (1972: 165) has suggested that some of the specimens from Java and Sumatra listed by Ulmer (1951) are in fact *scutellatus*; Banks's concept of *nigricornis* is discussed under *astictus* (p. 79) and *umbripes* (p. 96). With most of these misidentifications rectified, it now appears that the true *nigricornis* is much more rare and restricted than was previously thought.

Betten & Mosely (1940) suggested that *bipunctatus* was almost certainly a synonym of *nigricornis*, but there are differences in the male and female genitalia which, together with the widely separated distributions, suggest that the two should be kept distinct.

DISTRIBUTION. India, Vietnam, Sumatra, Java.

MATERIAL EXAMINED

India: 1 ♂, no further data; 1 ♀ (*Saunders*); 2 ♀, Manipur, Imphal (*Ram*). **Vietnam:** 1 ♀, Cha Pa, viii.1936 (*Masseyeff*). **Sumatra:** 1 ♀, 1892 (*Forbes*). **Java:** 1 ♀ (*Horsfield*). (All in BMNH.)

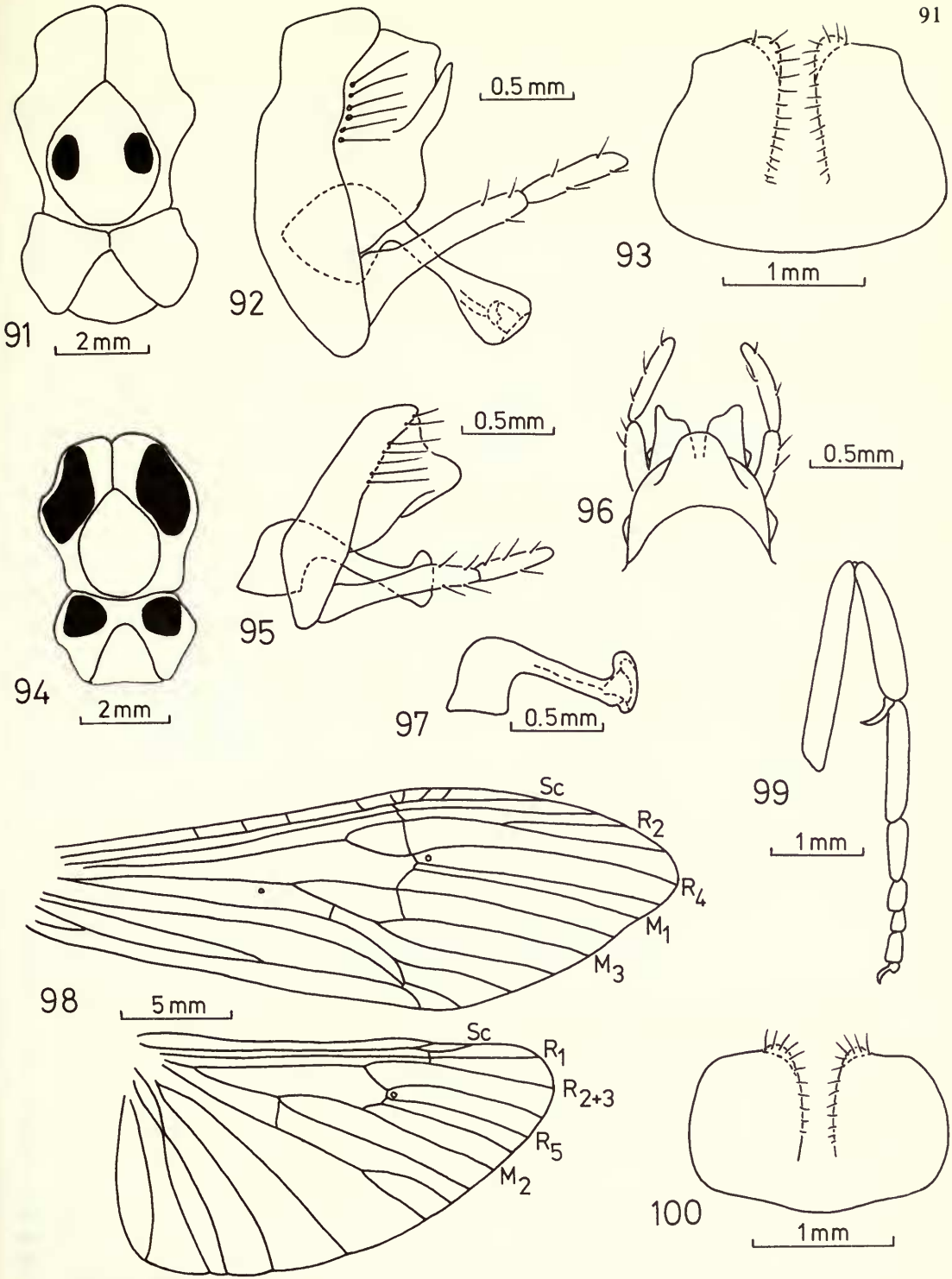
Polymorphanisus quadripunctatus Ulmer
(Figs 94–100)

Polymorphanisus quadripunctatus Ulmer, 1951: 186. Holotype ♀, BORNEO: Nanga Raven [? Nangaraun], vii. 1907 (*Buttikofer*) (ZM, Hamburg) [examined].
Polymorphanisus quadripunctatus Ulmer; Weidner, 1964: 91. [Holotype depository.]

♂. Antennae 35 mm long, with about 70 segments. Antennal segments pale golden yellow, with dark brown joints. Body yellowish brown, thorax with four black markings, two on mesoscutum and two on metascutum (Fig. 94). Wings greenish yellow, wing length estimated 18 mm (single specimen damaged). Spurs 1.3.3, spur on fore leg very long and curved.

♀. Similar to ♂, wing length 17–23 mm. Venation as in Fig. 98. Spurs 1.3.3, spur on fore leg curved as in ♂ (Fig. 99).

GENITALIA ♂ (Figs 95–97). Distal segment of gonopod long and narrow. Aedeagus with prominent disc-like enlargement at apex, not gradually thickened.



Figs 91–100 91–93, *Polymorphanisus nigricornis*, (91) ♂ thorax, dorsal view; (92) ♂ genitalia, lateral view; (93) ♀ eighth sternite, ventral view. 94–100, *P. quadripunctatus*, (94) ♂ genitalia, dorsal view; (95) ♂ genitalia, lateral view; (96) ♂ genitalia, dorsal view; (97) aedeagus, lateral view; (98) ♀ wing venation; (99) ♀ fore leg; (100) ♀ eighth sternite, ventral view.

GENITALIA ♀ (Fig. 100). Sides of eighth sternite strongly rounded, with prominent setigerous projection on inner posterior corners.

REMARKS. This is the first time that the male of this species has been described; the shape of the aedeagus of the single male specimen is strikingly different from all other species in the genus.

DISTRIBUTION. Borneo (Sarawak), Philippines (Palawan).

MATERIAL EXAMINED

Borneo: 2 ♀, Sarawak, Bidi (*Brooks*); 2 ♀, Sarawak, foot of Mt Dulit, junction of rivers Tinjar and Lejok, 1–15.ix.1932 (*Hobby & Moore*); 1 ♂, 14 ♀, Sarawak, Gunong Mulu National Park, at light, ii-iv.1978 (*Holloway et al.*). (All specimens in BMNH.) **Philippines:** 1 ♀, Palawan, Chromite Mine, 28 km W. Puerto Princessa, 1–7.xii.1965 (*Davis*) (USNM, Washington).

Polymorphanisus scutellatus Banks
(Figs 101–103)

Polymorphanisus scutellatus Banks, 1939: 55. Holotype ♀, BORNEO: Sarawak, Baram River district, 1912 (*Smith*) (type no. 23472, MCZ, Harvard) [examined].
Polymorphanisus scutellaris Banks; Kimmins, 1955: 399. [Incorrect subsequent spelling of *scutellatus* Banks.]

♂. Unknown.

♀. Antennae up to 50 mm long, with about 95 segments. Antennal segments yellowish brown, slightly darker distally. Body colour yellowish brown, thorax with two very large oval black markings on mesoscutellum, which meet sides of sclerite (Fig. 102). Wings pale green or yellowish, wing length 16–24 mm. Venation as in Fig. 101, fork R_2 in fore wing shorter than, or just equal to, its stem. Spurs 1.3.2.

GENITALIA ♀ (Fig. 103). Plates of eighth sternite long and narrow, with broadly rounded excision in outer sides.

REMARKS. All the specimens of *scutellatus* that I have examined have remarkably constant thoracic markings, yet two variations were figured by Ulmer (1951: pl. 10, figs 222, 224). The latter form may be referable to *muluensis* (see p. 88) and the former may conceivably be *unipunctus*; only the collection of a great deal more material from the Indochina peninsula could help to resolve these problems.

DISTRIBUTION. Sumatra, Java (Ulmer, 1951), Borneo (Sarawak), Sulawesi.

MATERIAL EXAMINED

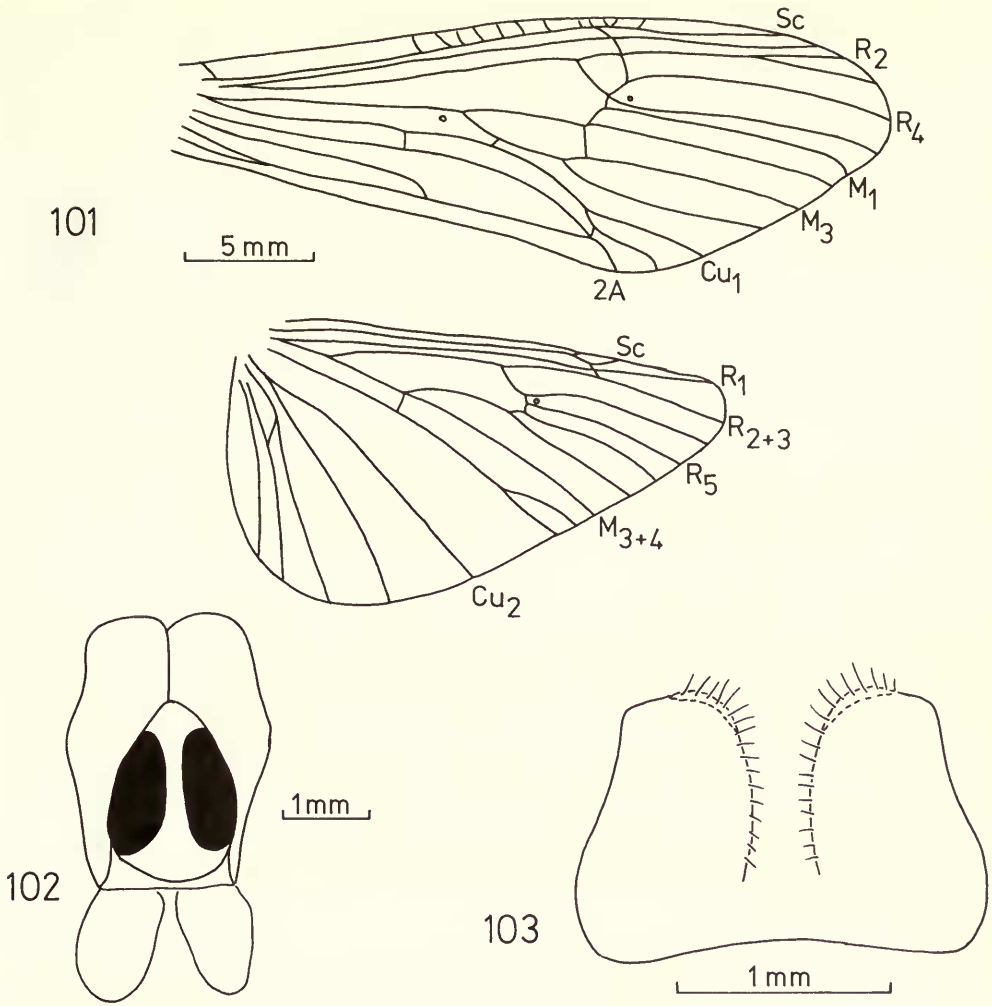
Sumatra: 2 ♀, Medan, 4.ix.1921, Pagar Marbau, 24.vii.1921 (*Corporaal*) (IRSNB, Brussels). **Borneo:** 3 ♀, Sarawak, foot of Mt Dulit, junction of rivers Tinjar and Lejok, at light, 28.viii–1.ix.1932 (*Hobby & Moore*); 1 ♀, Sarawak, Long Lama, at light, 2.i.1967 (*Kueh*); 1 ♀, Sarawak, Gunong Mulu National Park, Batu base camp, at light, 27.v.1978 (*Hammond & Marshall*); 5 ♀, Sarawak, Gunong Mulu National Park, at light, i–iv.1978 (*Holloway et al.*). **Sulawesi:** 2 ♀, Maros, ix.1923 (*Brooks*); 2 ♀, Macassar. (All specimens in BMNH.)

Polymorphanisus semperi (Brauer)
(Figs 104–109)

Oestropsis semperi Brauer, 1868: 264. LECTOTYPE ♂, PHILIPPINES: Mindanao, vii–x.1864 (*Semper*) (IRSNB, Brussels), here designated [examined].
Polymorphanisus semperi (Brauer) Ulmer, 1907: 23.

♂. Antennae 50 mm long, with about 90 segments. Scape and pedicel with faint longitudinal brown stripe externally, flagellar segments dark golden brown. Body yellowish brown, thorax with a pair of elongate dark brown or black markings on mesoscutellum, not touching sides of sclerite (Fig. 105). Wings falcate, greenish yellow, with golden yellow stripes along the apical veins. Wing length 19–22 mm, venation as in Fig. 104. Spurs 1.3.3.

♀. Antennae 40 mm long, with up to 85 segments. General coloration as ♂, but scape and pedicel usually lacking brown stripe. Thoracic markings similar to ♂, but often fainter. Wings not falcate, and without apical stripes; venation as in Fig. 108. Wing length 21–27 mm. Spurs 1.3.3.



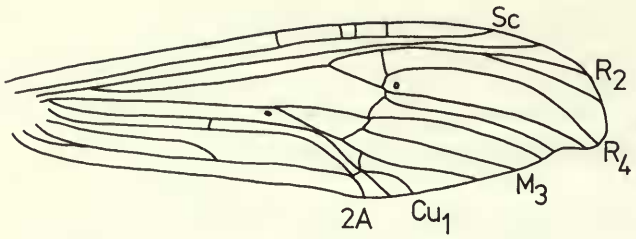
Figs 101–103 *Polymorphanisus scutellatus* ♀. 101, wing venation; 102, thorax, dorsal view; 103, eighth sternite, ventral view.

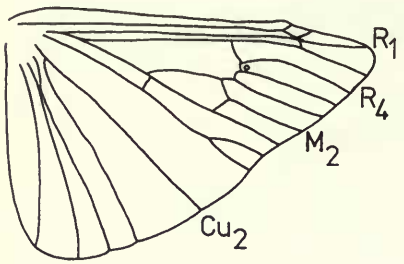
GENITALIA ♂ (Figs 106, 107). Terminal segment of gonopod stout. Tenth segment bilobed, viewed dorsally.

GENITALIA ♀ (Fig. 109). Plates of eighth sternite straight-sided, subquadrangular, with only slightly rounded posterior corners.

REMARKS. I have been unable to identify the type-localities cited by Brauer (1868) as 'Dugang' [? = Duguan] on Mindanao, and 'Baubo'. None of the four syntypes examined was labelled with a locality. I am including the two specimens in the BMNH in the syntype series because, as well as having been labelled as types by McLachlan (from whose collection they originated), one bears a small label with the number '546'. One of the syntypes from the IRSNB, Brussels, bears the number '545' in the same hand, suggesting that both were in the same collected series, although the significance of the numbers is unknown. Brauer did not indicate how many specimens constituted his type-series.

DISTRIBUTION. Philippines.





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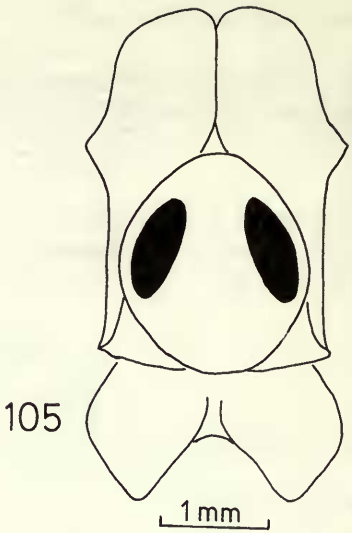
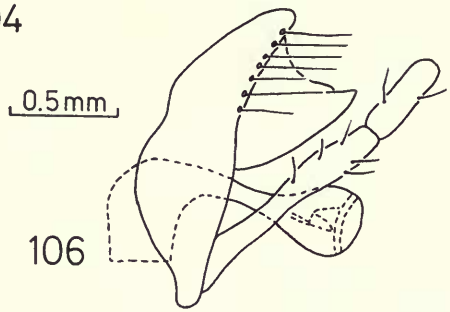
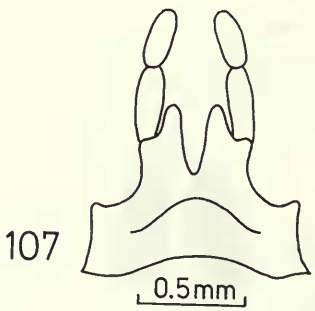
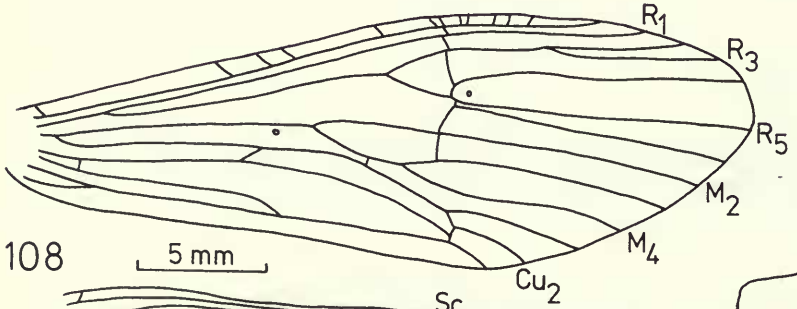
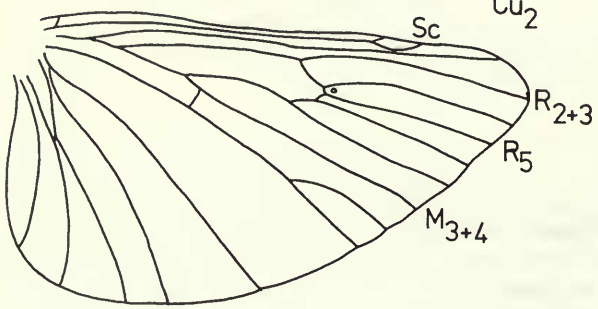
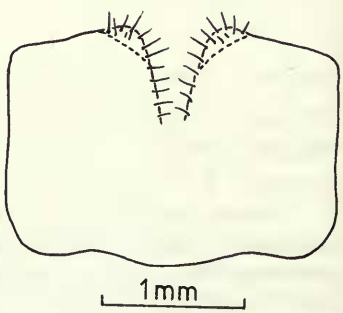












Figs 104–109 *Polymorphanisus semperi*. 104, ♂ wing venation; 105, ♂ thorax, dorsal view; 106, ♂ genitalia, lateral view; 107, ♂ genitalia, dorsal view; 108, ♀ wing venation; 109, ♀ eighth sternite, ventral view.

MATERIAL EXAMINED

Philippines: 2 ♂, 1 ♀, Mindanao, vii–x.1864 (*Semper*) (1 ♂ in IRSNB, Brussels; 1 ♂, 1 ♀ in BMNH) (paralectotypes); 8 ♂, no further data (BMNH); 2 ♂, 3 ♀, Luzon, Mt Makiling; 2 ♂, Mindanao, Surigao (*Baker*) (USNM, Washington).

Polymorphanisus taoninus Navás
(Fig. 110)

Polymorphanisus taoninus Navás, 1936: 128. Holotype ♀, CHINA: Kwangsi-Chuang, Wuchow, 9.v.1934 (*Tao*) (depository unknown) [not examined].

♂. Unknown.

♀ (translated from Navás, 1936). 'Head yellow-fulvous; eyes black; antennae black, first two segments same colour as head, apical segments testaceous, bases of segments dark; longer than 25 mm. Thorax whitish green below, greenish fulvous above. Abdomen yellowish green? (badly preserved). Legs fulvous, second tarsi fulvous-green. Wings unmarked; membrane lightly coloured fulvous-green; venation fulvous-yellow. Anterior wing [Fig. 110]; apical fork 1 [fork R_2] shorter than its stalk; discal cell short and broad, wider than long, outer margin perpendicular to radial sector; median cell more than three times as long, a little wider . . . [etc.]'

'Wing length 23 mm.'

REMARKS. Navás (1936) describes this species as being similar to *astictus*, but the dark antennae and short fork R_2 are very similar to *unipunctus* (described on p. 96). It is possible that Navás may have overlooked a central thoracic spot, which could easily be obscured by the pin, in which case Navás's name would take priority over *unipunctus*.

DISTRIBUTION. China (Kwangsi-Chuang).

Polymorphanisus tumidus Banks
(Figs 111–113)

Polymorphanisus tumidus Banks, 1939: 54. Holotype ♀, INDIA: Mysore, Shimoga, R. Tunga, 1865′ [560 m], at light, 17.iv.[? year] (*Nathan*) (type no. 23468, MCZ, Harvard) [examined].

♂. Unknown.

♀. Antennal length unknown (specimen damaged). Scape with rounded black spot anteriorly (Fig. 112), other segments greenish yellow. Head yellow, with greatly swollen, green frons (Fig. 112). Rest of body greenish yellow, thorax with two elongate black spots, each expanded postero-laterally (Fig. 112). Wing length 20 mm (holotype only), fore wing venation as in Fig. 111: fork R_2 very long. Spurs 1.3.3.

GENITALIA ♀ (Fig. 113). Plates of eighth sternite subquadrangular, with moderately rounded outer corners.

REMARKS. The curiously inflated frons of the unique holotype of this species appears teratological, yet the thoracic and antennal markings distinguish it from all other species of the genus.

DISTRIBUTION. India (Mysore).

MATERIAL EXAMINED

Holotype only.

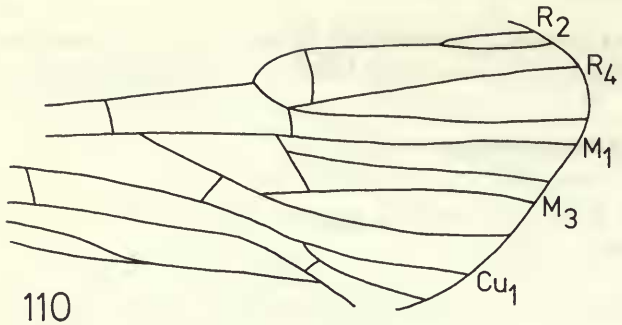
Polymorphanisus umbripes sp. n.
(Figs 114–116)

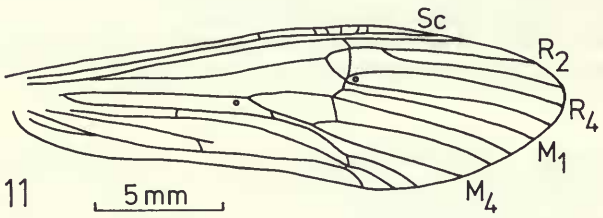
[*Polymorphanisus nigricornis* Walker; Banks, 1939: 53. Misidentification.]

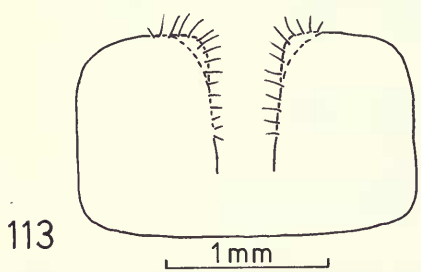
♂. Unknown.

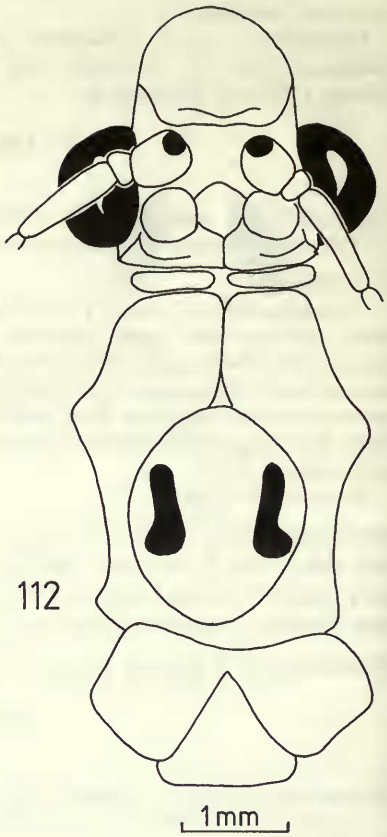
♀. Antennae up to 40 mm long, with about 75 segments. Scape and pedicel greenish yellow, scape with small dark brown spot distally (occasionally absent), pedicel with lateral brown stripe; flagellar segments dark brown (Fig. 115). Body yellowish brown, abdomen darker dorsally; thorax unmarked. Forelegs with most of femur and whole of tibia dark brown; tarsi yellowish brown. Spurs 1.3.3. Wing length 21–24 mm, venation as in Fig. 114.

GENITALIA ♀ (Fig. 116). Eighth sternite tapering posteriorly, outer posterior corners rounded in a gentle curve.









Figs 110–113 110, *Polymorphanisus taoninus* ♀, part of fore wing (after Navás). 111–113, *P. tumidus* ♀, (111) fore wing venation; (112) head and thorax, dorsal view; (113) eighth sternite, ventral view.

REMARKS. This species is based on the series of specimens which Banks (1939) assumed to be *nigricornis* Walker (see remarks under *nigricornis*, p. 90). The two Indian localities of this species are the same for Banks's *flavipes* (= *astictus*) and this would suggest that *umbripes* may be merely a colour variant of the latter with dark antennae and forelegs, but the differences in female genitalia are also consistent in the specimens examined.

DISTRIBUTION. India (Mysore).

MATERIAL EXAMINED

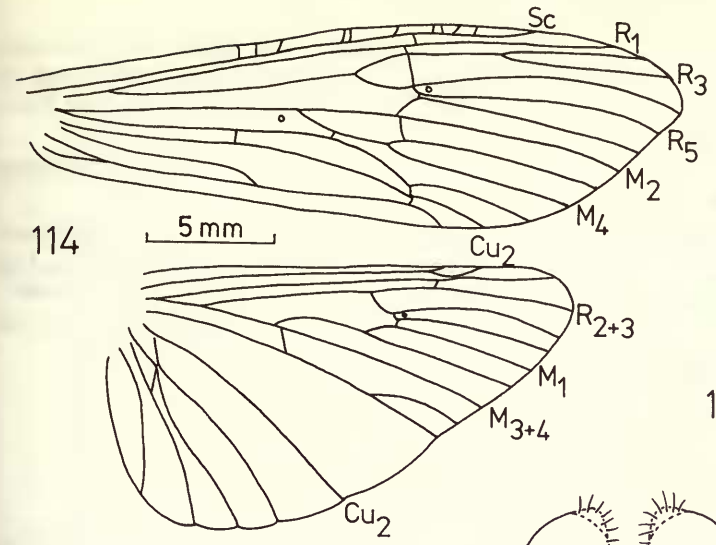
Holotype ♀, **India:** Mysore, Shimoga, R. Tunga, 1865′ [560 m], at light, 18.vi. [? year] (*Nathan*) (type no. 32396, MCZ, Harvard).

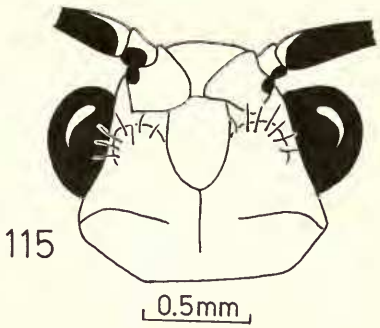
Paratypes. **India:** 29 ♀, data as holotype, various dates (26 in MCZ, Harvard; 2 in USNM, Washington; 1 in BMNH); 4 ♀, Mysore, Bhadravati (*Nathan*) (MCZ, Harvard).

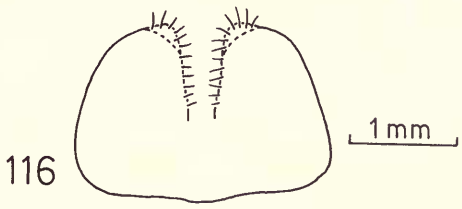
Polymorphanisus unipunctus Banks
(Figs 117–119)

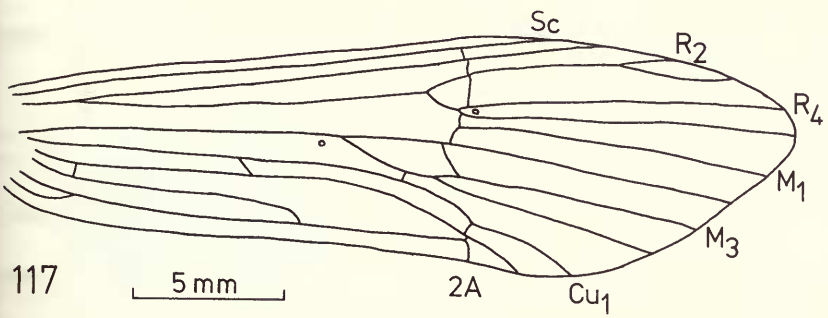
Polymorphanisus unipunctus Banks, 1939: 53. Holotype ♀, CHINA: Szechwan, Suifu [= Ipin], viii.1928 (*Graham*) (type no. 53164, USNM, Washington) [examined].

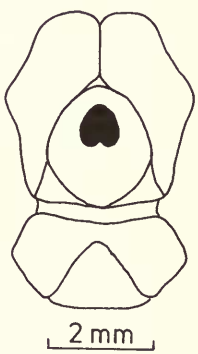
Polymorphanisus unipunctus Banks; Banks, 1940: 206. [Redescription as new species.]

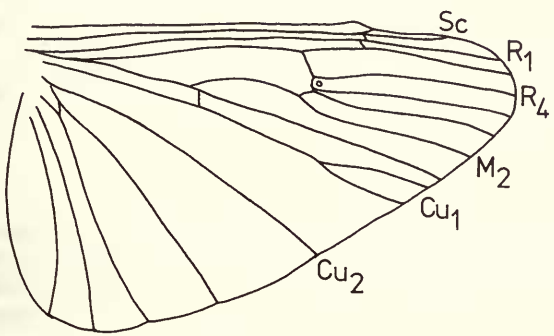


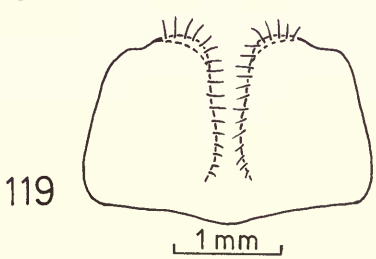












Figs 114–119 114–116, *Polymorphanisus umbripes* ♀, (114) wing venation; (115) head, dorsal view; (116) eighth sternite, ventral view. 117–119, *P. unipunctus* ♀, (117) wing venation; (118) thorax, dorsal view; (119) eighth sternite, ventral view.

♂. Unknown.

♀. Antennal length unknown (specimen damaged). Scape and pedicel yellow, flagellar segments dark brown. Body yellowish brown, thorax with a single, partially divided, black spot in anterior half of mesoscutellum (Fig. 118). Wing length 25 mm, venation as in Fig. 117; fork R_2 shorter than its stem. Spurs 1.3.2.

GENITALIA ♀ (Fig. 119). Setigerous posterior margin of each half of eighth sternite produced in a rounded lobe.

REMARKS. The possible similarity of this species with Navás's description of *taoninus* is discussed under the latter species. Banks's (1939) first description of this species was obviously intended to be published later than his second paper (1940). In the *Trichopterorum Catalogus* Fischer (1963: 209) lists the first reference as 'nomenclatorially invalid', presumably as a nomen nudum, but in fact this first (1939) paper contains sufficient detail to constitute a valid description.

DISTRIBUTION. China (Szechwan).

MATERIAL EXAMINED

Holotype only.

The *ocularis*-group

Pale greenish white species, never with markings on thorax. Wings broad, with brown markings (absent in *angustipennis*). Antennae up to one and a half times fore wing length. Male eyes large, almost meeting ventrally. Spurs 1.3.2. In fore wing M_1 is direct continuation of M_{1+2} stem, M_2 arises from median cell. In hind wing R_1 ends on *Sc*. Basal segment of male gonopods expanded, terminal segment not differentiated.

Polymorphanisus angustipennis Ulmer
(Figs 120–128)

Polymorphanisus angustipennis Ulmer, 1912: 97. Holotype ♂, CAMEROUN: Ma[y]o Godi, 9–13.vi.1909 (*Riggenbach*) (MNHU, Berlin) [examined].
Polymorphanisus sp.; Marlier & Botosaneanu, 1968: 11. [Compared with *P. similis* Ulmer.]

♂. Antennae up to 20 mm long, with about 50 segments. Antennae and rest of body pale yellowish brown, legs greenish, wings greenish white, with no dark markings. Eyes very large, almost meeting ventrally (Fig. 122). Wing length 12–14 mm, venation as in Fig. 120. Spurs 1.3.2.

♀. Antennae and general coloration as in ♂. Eyes small, well separated ventrally (Fig. 127). Wing length 15–17 mm, venation as in Fig. 125. Spurs 1.3.2.

GENITALIA ♂ (Figs 123, 124). Ninth segment bifurcate dorsally. Gonopods only moderately expanded basally.

GENITALIA ♀ (Fig. 128). Eighth sternite long and narrow, straight-sided, with only slightly rounded posterior corners.

REMARKS. This species is easily distinguished from *similis*, with which it shares a similar distribution, by the absence of wing markings.

DISTRIBUTION. Ghana, Nigeria, Cameroun, Sudan, Uganda.

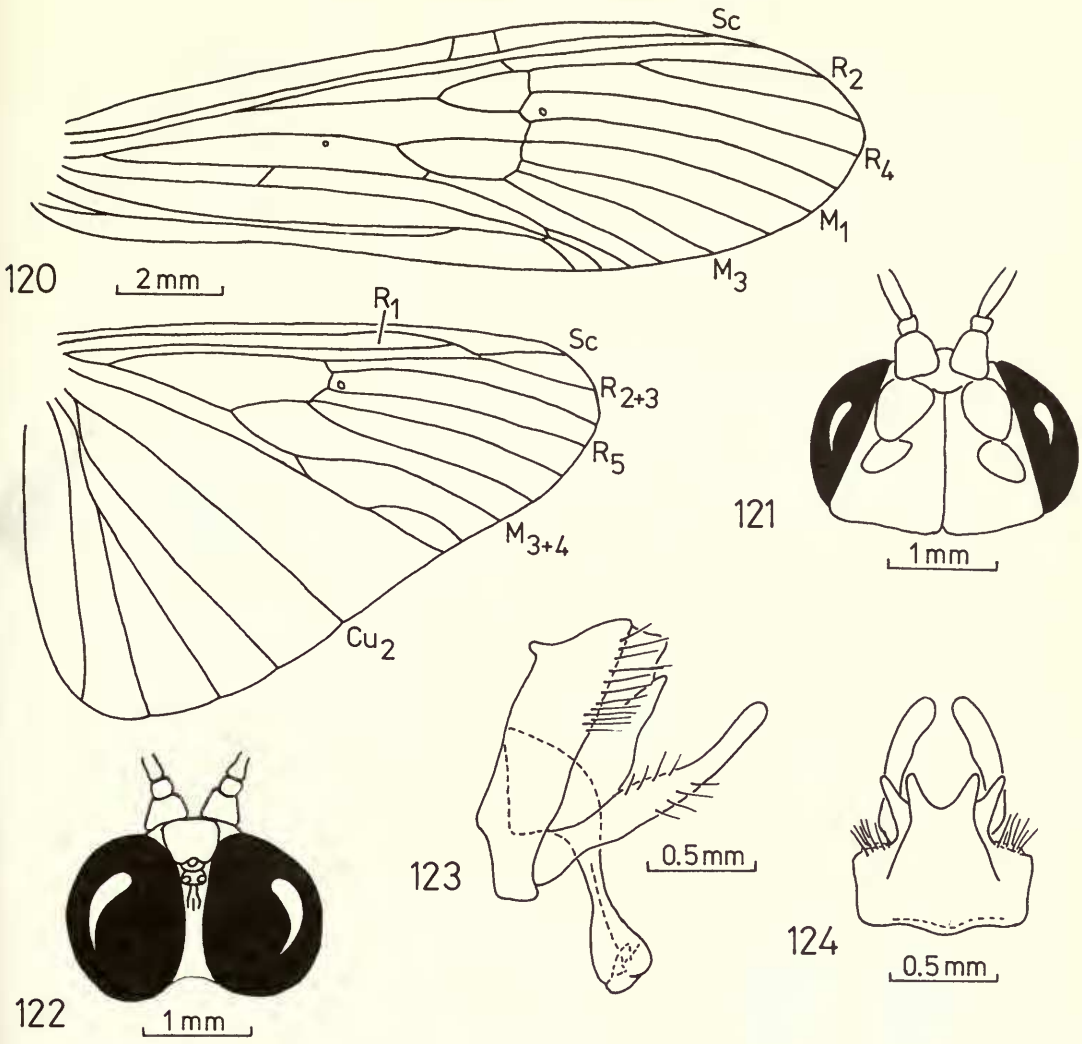
MATERIAL EXAMINED

Ghana: 1 ♂, Volta R., Yeji, 14.x.1950 (*Berner*). **Nigeria:** 1 ♀, Kaduna, 16.x.1957; 16 ♀, Samaru, at light, 7–14.vii.1970 (*Ward*); 38♂, 8 ♀, Lake Kainji, 1975 (*Bidwell*). **Sudan:** 2 ♀, Malakal–Shambe, 8–14.xii.1961 (*Cloudsley-Thompson*). **Uganda:** 2 ♀, Ugweano, 22.viii.1949 (*Lowe*); 2 ♀, Lake Victoria, Bukakata, 13.xii.1950 (*Lowe*), 6.viii.1959 (*Corbet*); 2 ♂, Mengo, Entebbe, 28–30.iii.1956 (*Corbet*). (All specimens in BMNH.)

Polymorphanisus guttatus Navás
(Figs 133, 134)

Polymorphanisus guttatus Navás, 1935: 71. Holotype ♀, MADAGASCAR: Ambodirefia, 70 km NW. of Tamatave, ii.1934 (MNHN, Paris) [examined].

♂. Unknown.



Figs 120–124 *Polymorphanisus angustipennis* ♂. 120, wing venation; 121, head, dorsal view; 122, head, ventral view; 123, genitalia, lateral view; 124, genitalia, dorsal view.

♀. Antennal length at least 25 mm (specimens damaged). Scape and pedicel yellow, first flagellar segment dark brown distally, rest of flagellum dark brown. Body yellowish brown. Wing length 16–20 mm, membrane greenish, with one brown spot on median cell of fore wing, at base of M_2 and M_3 (Fig. 133). Spurs 1.3.2.

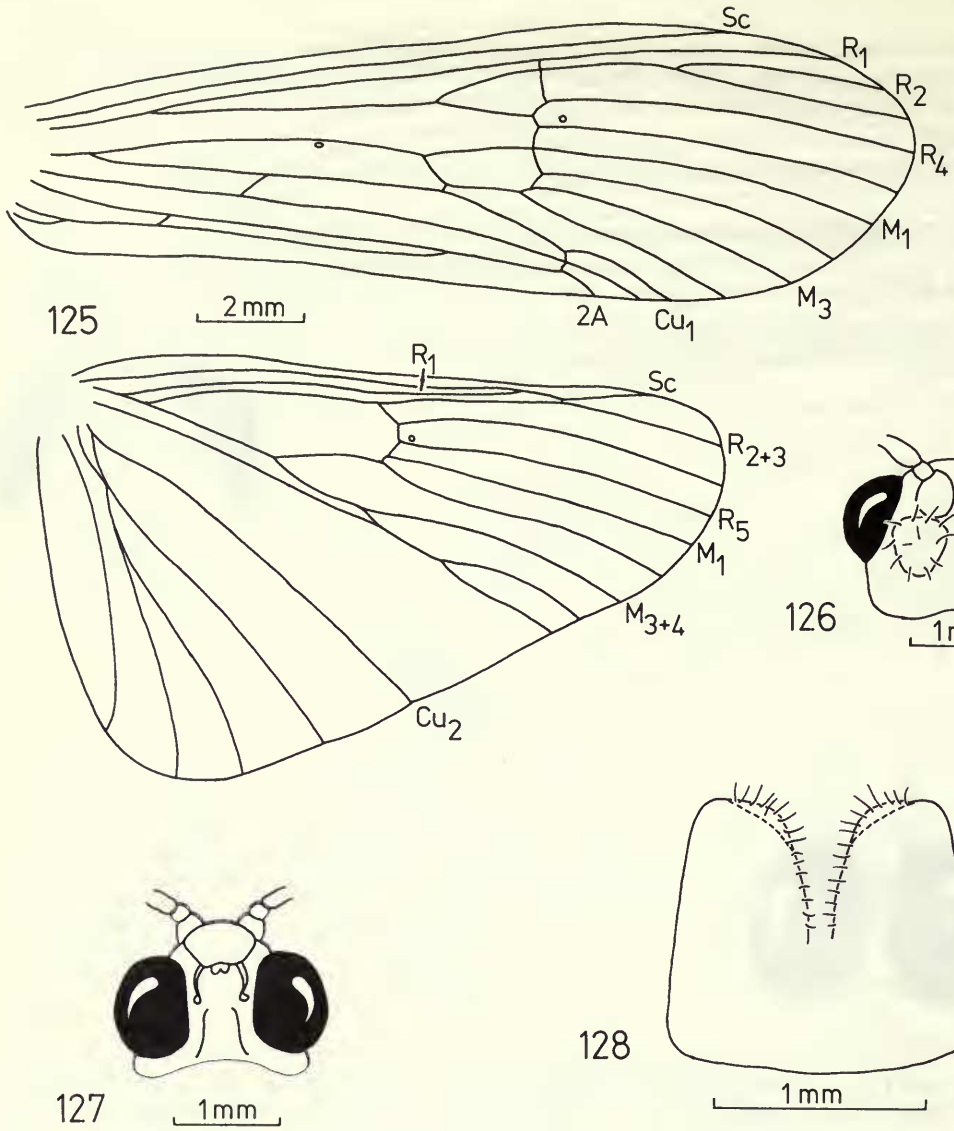
GENITALIA ♀ (Fig. 134). Eighth sternite broad centrally, posterior corners obtusely rounded. Setigerous lobe on posterior margin strongly produced.

REMARKS. This species, apparently endemic to Madagascar, is easily recognized by the dark antennae and single spot on the fore wing.

DISTRIBUTION. Madagascar.

MATERIAL EXAMINED

Madagascar: 1 ♀, Station Perinet, 149 km E. of Tananarive, 20.x–10.xi.1930 (*d'Olsoufieff*) (BMNH).



Figs 125–128 *Polymorphanisus angustipennis* ♀. 125, wing venation; 126, head, dorsal view; 127, head, ventral view; 128, eighth sternite, ventral view.

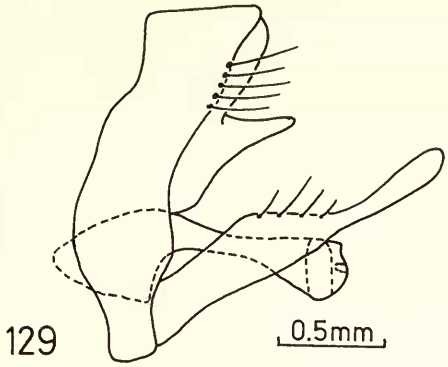
Polymorphanisus ocularis Ulmer
(Figs 135–138)

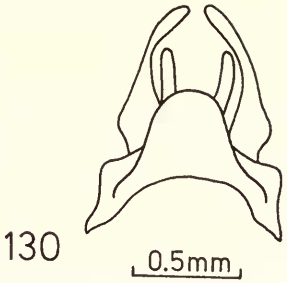
Polymorphanisus ocularis Ulmer, 1906: 60. LECTOTYPE ♀, JAVA (*Piepers*) (RNH, Leiden), here designated [examined].

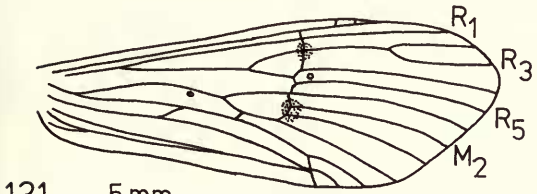
Polymorphanisus indicus Banks, 1911: 105. Holotype ♀, INDIA: Bengal, Pusa, at light, 4.viii.1909 (type no. 11787, MCZ, Harvard) [examined]. **Syn. n.**

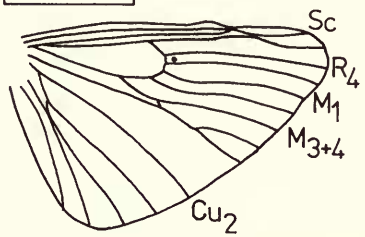
Polymorphanisus ocularis Ulmer, unnamed var.; Martynov, 1935: 195.

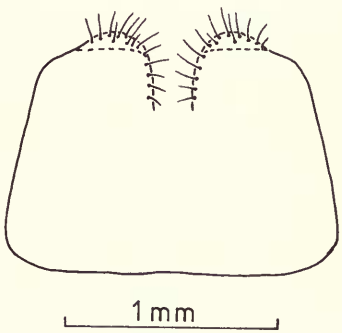
♂. Antennae up to 23 mm, with about 50 segments. Antennal segments pale golden yellow. Body pale yellowish white, abdomen yellowish brown dorsally. Wings white, occasionally greenish, with two brown

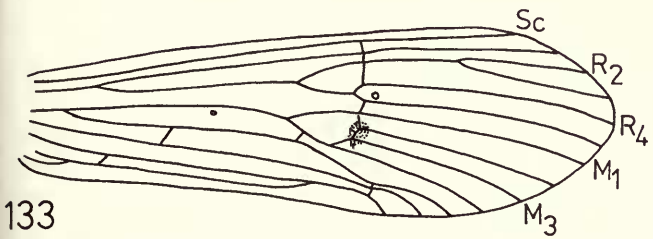


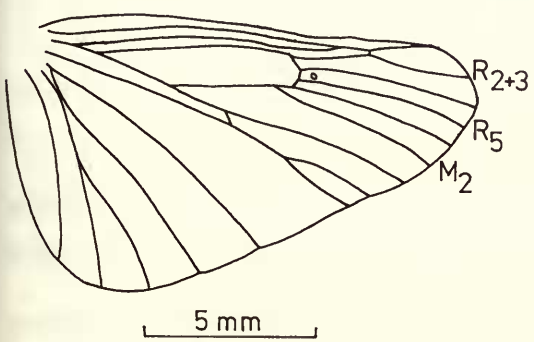


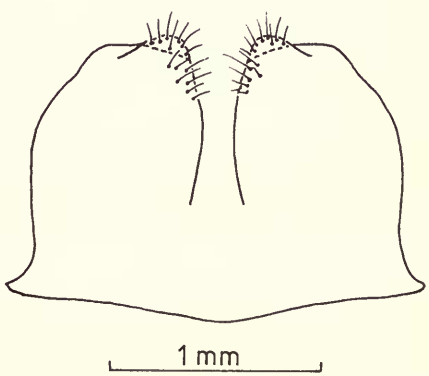




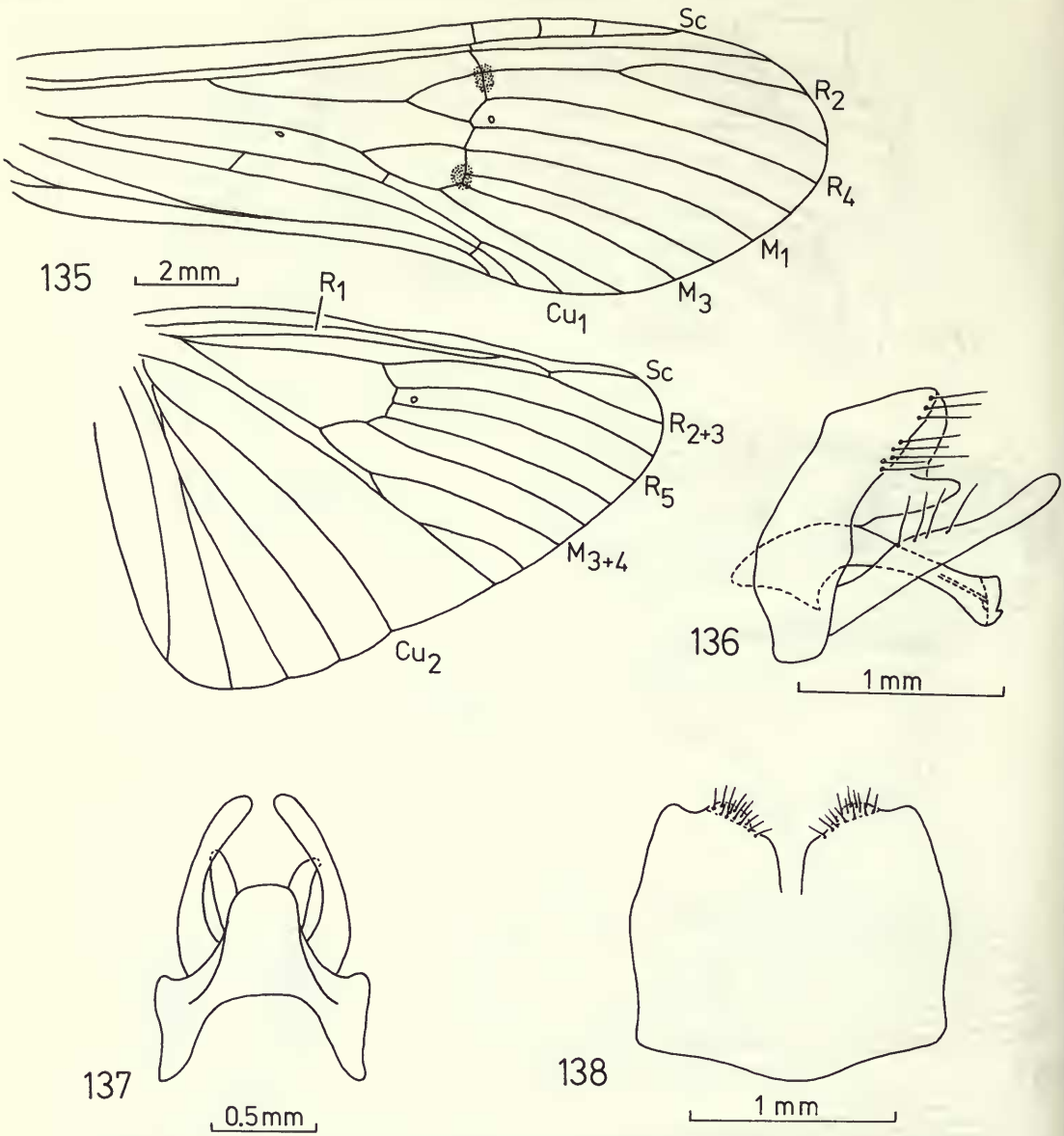








Figs 129–134 129–132, *Polymorphanisus similis,* (129) ♀ genitalia, lateral view; (130) ♂ genitalia, dorsal view; (131) ♀ wing venation; (132) ♀ eighth sternite, ventral view. 133, 134, *P. guttatus* ♀, (133) wing venation; (134) eighth sternite, ventral view.



Figs 135–138 *Polymorphanisus ocularis*. 135, ♂, wing venation; 136, ♂ genitalia, lateral view; 137, ♂ genitalia, dorsal view; 138, ♀ eighth sternite, ventral view.

spots on fore wing, one on discal cell at base of R_{2+3}, the other on median cell at base of M_2 and M_3 (Fig. 135). Wing length 14–16 mm. Spurs 1.3.2.

♀. Antennae up to 22 mm, with about 50 segments. Coloration as in ♂. Wing length 14–18 mm. Spurs 1.3.2.

GENITALIA ♂ (Figs, 136, 137). Ninth segment produced in a squarish lobe dorsally. Gonopods relatively narrow at base, thickened in centre.

GENITALIA ♀ (Fig. 138). Outer posterior corners of eighth sternite produced into rounded lobes, almost as long as setigerous lobes on inner corners.

REMARKS. Banks's (1911) species *indicus* was described without reference to *ocularis*, although he later (1939) listed both in the same paper. Martynov (1935) remarked that he could not separate the two, and Ulmer (1951) noted their great similarity; in fact they cannot be separated and *indicus* is here synonymized.

Ulmer described *ocularis* from one male and one female, but the male is now apparently missing (Geijskes, *in litt.*). I have therefore designated the female as lectotype.

DISTRIBUTION. India, Sri Lanka, Burma (Martynov, 1935), China (Fuchow), West Malaysia, Borneo (Sarawak), Java, Sumatra (Ulmer, 1951).

MATERIAL EXAMINED

1 ♂, 1 ♀, no data (*Chapman*) (BMNH). **Sri Lanka:** 1 ♂ Colombo, iii.1927 (BMNH); 2 ♀, Marai Villu, 19–21.iii.1933 (BMNH); 1 ♀, Marichchukkaddi, 28.iii.1933 (BMNH); 1 ♀, Puttalam (BMNH); 1 ♀, Boyagama, at light, 20–21.viii.1973 (*Ekis*) (USNM, Washington); 2 ♀, Wilpattu Park, Talawila, at light, 9–10.iv.1973 (*Baumann & Cross*) (USNM, Washington), 1 ♀, Hunuwilagama, Wilpattu, 10–19.iii.1970 (*Davis & Rowe*) (USNM, Washington); 2 ♀, Polonnaruwa, 16–21.iii.1954, 1 ♀, Mi Oya, 25.iii.1954 (*Schmid*) (USNM, Washington). **China:** 1 ♀, Fuchow (*Yang*) (BMNH). **West Malaysia:** 1 ♀, Kuala Pilah (BMNH); 3 ♀, Kuala Lumpur, 28.vi.1929, 23.iv.1931, 6.vi.1932 (*Pendlebury*) (BMNH); 2 ♀, Kota Tinggi, Johore, viii.1917 (BMNH). **Borneo:** 1 ♂, no further data (BMNH); 2 ♀, Sarawak, Gunong Mulu National Park, i–iv.1978 (*Holloway et al.*) (BMNH).

Polymorphanisus similis Ulmer
(Figs 129–132)

Polymorphanisus similis Ulmer, 1912: 96. Holotype ♂, CAMEROUN: Lolodorf, 16.v.1896 (*Conradt*) (MNHU, Berlin) [examined].

Polymorphanisus bisignatus Navás, 1931*b*: 276. Holotype ♀, ZAIRE: Katanga, Kafakumba, 16.v.1925 (*Overlaet*) (MRAC, Tervuren) [examined]. **Syn. n.**

♂. Antennal length 23 mm (holotype), antennal segments pale yellow. Body pale yellow, abdomen darker dorsally. Wings white, occasionally greenish, with two brown spots on fore wing, one on discal cell at base of R_{2+3} and one on median cell at base of M_2 and M_3. Wing length 13–16 mm. Spurs 1.3.2.

♀. Antennal length up to 30 mm, with up to 60 segments. Coloration as ♂, wing venation as in Fig. 131. Wing length 16–23 mm. Spurs 1.3.2.

GENITALIA ♂ (Figs 129, 130). Ninth segment produced into a broad rounded lobe dorsally. Gonopods very broad at base, narrowing suddenly in centre.

GENITALIA ♀ (Fig. 132). Eighth sternite gradually tapering posteriorly, posterior edge sloping evenly to setigerous lobes.

REMARKS. Although Ulmer's descriptions were usually accurate, he mistakenly described the spur formula of this species as being 2.3.3 (Ulmer, 1912). The male holotype is clearly seen to have the spur formula 1.3.2, typical of this group. This inaccuracy has confused authors such as Marlier (1961) who draws attention to the apparent discrepancy between his female specimen and the description of the male holotype. However, Marlier & Botosaneanu's (1968) '*Polymorphanisus* cf. *similis*' is *angustipennis*, as shown by the lack of wing markings.

DISTRIBUTION. Sierra Leone, Nigeria, Cameroun, Zaire, Uganda.

MATERIAL EXAMINED

Sierra Leone: 1 ♀, Bo, ix.1968 (*Revell*); 2 ♀, Njala, 11.viii.1929, ix.1934 (*Hargreaves*). **Nigeria:** 1 ♂, Ilesha (*Humfrey*); 1 ♀, Zungeru, xi.1910 (*Simpson*); 1 ♀, Abuja, at light, 21.xi.1970 (*Deeming*); 1 ♀, Kagoro Forest, 15–17.x.1971 (*Deeming*). (All specimens in BMNH.) **Uganda:** 1 ♀, Ankole, 25 m [40 km] S. of Kichwamba, Kalinzu Forest, 28.iv.1968 (*Spangler*) (USNM, Washington).

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Synonyms are in *italics;* main references are in **bold.** References to the Check-list (p. 63) are not included.